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QUERIES AND ANSWERS.

Flies in Butchers' Shops.

We have received an inquiry from the London Retail Meat Traders' Association as to the best method of getting rid of flies from butchers' shops.

If the flies have been allowed to breed, screening is the best palliative, but the real remedy is prevention, by getting rid of their breeding places—offal and manure. An expert, to whom we have referred the matter, informs us that during the war in South Africa, where flies were a veritable plague (sharing, according to Kitchener, the first place with women), he found that sprinkling chloride of lime got rid of them from camps and messes. A good method for butchers' shops is as follows: After cleaning down the walls, etc., in the ordinary way, they should be treated with a solution of chloride of lime, and then sprayed lightly with paraffin. Of the last very little is needed, and if too much is used there is a risk of imparting smell and taste to the meat. Its action appears to be due to its preventing any flies that may enter from getting a foothold, but the chloride of lime will keep most away.

Majorca.

"D. F. H." asks for information about Majorca as a health resort, as to hotels, medical aid available, and the best route from England.

*** According to a statement in *Climatotherapy and Balneotherapy* by Sir Hermann and F. Parkes Weber (1907) Palma, the capital of Majorca, is built on a bay facing south, and is protected by the north-western mountain chain from the cold winds to which the Balearic Islands are exposed. It has a warm, moist, equable winter climate, with a mean winter temperature of about 52.5°. The accommodation at that date was limited, but the authors thought that at some future time the place might be visited by English invalids. It seems now to be believed that this time has come. The Spanish Travel Bureau, Ltd. (87, Regent Street, London, W.), inform us that a pamphlet on Majorca is in preparation and will shortly be ready. The best route is by Barcelona, which can be reached from London by way of Paris.

Income Tax.

Partnership—Succession.

"W. L. G." bought a one-third share in a practice as from October 1st, 1925, and has been assessed on the basis of his predecessor's earnings.

*** This is in accordance with the statute, Rule 11 applicable to Cases I and II, Schedule D, but if the new firm can show at the end of their first year (or part of a year) that the profits of the practice have fallen short from some specific cause—for example, because the practice is now worked from two houses instead of one—since or by reason of the change, then they can claim an adjustment of the assessment. It is, however, important to remember that the "profits" include the value of outstanding book debts earned by the new firm and not paid over; cash receipts are not a reliable basis of calculation where, as in this case, the old book debts are not being brought into the accounts.

Production of Bank-books.

"B. W." has been requested by the inspector of taxes to produce his bank pass-books for the six years ending June 30th, 1920; some of the books have been destroyed.

*** The inspector of taxes has no legal right to demand production of the bank-books, but the request is unusual, and the inspector may have, or may think he has, some special grounds for making it. In the circumstances "B. W." might usefully call on him and discuss the matter personally, inquiring what is the special reason for making so unusual a request, and write us more fully if he is unable to arrange a satisfactory settlement.

Chilblains.

Dr. H. E. Gibson (London) writes: As one who started this trouble when in the R.A.M.C. during the war, and has had it every winter since, I should like to suggest local treatment by ultra-violet rays. In my case it acts like magic, and is the only treatment I have found do any good. Possibly general light baths, with or without diathermy to the hands and feet, might prevent a recurrence.

Sir Robert Armstrong-Jones also writes to recommend ultra-violet rays. "Cases of marked bullous erythema due to chilblains have been relieved by one application of the ultra-violet light, and this treatment deserves to be recognized and acknowledged."

Dr. A. E. R. Rutherford (Westbury-on-Trym) writes: "C. P. J." can hardly hope, I think, for much success in his treatment of chilblains, with calcium salts especially, unless he warns his patient to avoid fruits and drinks containing citric acid—oranges, lemons, lemonade, etc. Citric acid would, I believe, prevent the beneficial result which might otherwise be expected from the use of calcium salts, and perhaps from other forms of treatment as well.

LETTERS, NOTES, ETC.

Dr. Charles Porter (University of Witwatersrand, Johannesburg) asks us to say that he has recently been erroneously described in *The World's Health Book* (a Red Cross journal) as Lieutenant-Colonel, R.A.M.C. The initial letters should have been S.A.M.C.

Maté or Paraguay Tea.

Dr. L. Gwillim Davies (Histon) has sent us some dried leaves which he learnt were being sold under the trade name "Hervea" and described as "the wonderful South American plant with marvellous tonic-restorative powers." The patient who first drew his attention to this preparation, and had been taking it (though not with his permission), told Dr. Gwillim Davies that the effect of the infusion was to "make her work and work, until she dropped with exhaustion." It occurred to him that the leaves might be those of the coca plant, or possibly maté. From personal experience he found that the leaves certainly had some stimulating property when drunk in infusion. The specimen forwarded to us has been examined on our behalf, and the analytical chemist's report is that it consists of the leaves of *Ilex paraguayensis*, the Brazilian or Paraguay holly, and contains no cocaine. The plant is used as tea in South America under the name of maté or Paraguay tea. Like tea it contains caffeine, tannic acid, and a volatile oil. Bentley states in his *Manual of Botany* that "its properties are similar to those of tea, but it is more exciting, and when taken to excess produces a kind of intoxication." It contains, according to Martindale's *Extra Pharmacopoeia*, 2.02 per cent. of caffeine, which is rather more than in coffee and rather less than in tea.

Enteric Fever and Sewage.

"M.O.H." writes: If enteric fever is caused by a specific bacillus, how does sewage matter, finding its way into drinking water or milk, cause the fever? I know of an outbreak in this locality some months ago: it was supposed to be due to drinking water which was polluted by sewage matter. The four families using the water from this well (being a country place) contracted the fever. None of the parties had been away; no case of enteric fever had been in the locality for years; no carrier could be traced. No doubt in a heap of decaying animal or vegetable matter we have numerous organisms (putrefactive), but can they be the cause of typhoid fever? Offensive smells may cause sick stomach headaches, etc., but they cannot cause a specific disease. In these cases I think we can account for the disease by what biologists call "variation" in organisms; for instance, the *Bacillus coli*, growing in a heap of decaying matter, may, in circumstances very favourable to its growth, undergo variation and become pathogenic, and even produce enteric. No biologist can, by observing the behaviour of germs in a test tube, give any guarantee as to variations which may take place in nature. As Professor Judd says, when speaking of organisms, "they drift into one another by imperceptible gradations." The observer can never see all the gradations in the test tube. This is a somewhat puzzling problem, and I would like to have the opinion of some of your readers on it.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 43, 44, 45, 46, 47, 50, and 51 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 48 and 49.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *223*.

British Medical Association.

PROCEEDINGS OF SECTIONS AT THE ANNUAL MEETING, NOTTINGHAM, 1926.

SECTION OF MEDICINE.

F. H. JACOB, M.D., F.R.C.P., President.

DISCUSSION ON BLOOD TRANSFUSION IN THE TREATMENT OF DISEASE.

OPENING PAPERS.

I.—SIR HUMPHRY ROLLESTON, BART., K.C.B., M.D., F.R.C.P.,
Regius Professor of Physic, Cambridge.

BEFORE considering the position of blood transfusion as employed at the present day it may be well, by way of introduction, to give a brief account of the history of the subject; for though it is only in recent years that transfusion has been employed to any extent, the idea is centuries old, an attempt having been made as far back as the middle of the seventeenth century. From that date down to the early years of the present century experiments were made at fairly wide intervals of time, as recorded in the following note.

Historical Note.

In his admirable monograph Geoffrey Keynes[42] has gone fully into all the aspects of transfusion, including the history, as would naturally be expected from such an eminent bibliophile. In his charming account of early science in Oxford R. T. Gunther quotes a letter of John Aubrey, the antiquary, to the effect that the idea of curing diseases "by transfusion of blood out of one man into another" arose in the mind of Francis Potter, B.D., Fellow of Trinity College, Oxford, about 1639, from reflection on Ovid's story of Medea and Jason, and that about 1650 these two friends tried the operation unsuccessfully on a hen. Aubrey read a letter from Potter on the subject to the Royal Society, and had it entered in their books, "for Dr. Lower would have arrogated the invention to himself." The share of Sir Christopher Wren in bringing up the subject and Richard Lower's experiments at Oxford in 1665 (published in 1666) are historical. As to the priority of the first transfusion on the human subject, Keynes unhesitatingly gives the credit to Jean Denys of Montpellier, physician to Louis XIV, but Lower and Edmund King were close upon him in November, 1667, in transfusing Arthur Coga, an indigent Bachelor of Divinity of Cambridge, with the blood of a sheep. After enthusiastic imitations, catastrophes led to the abeyance of transfusion. "As in private duty bound" I should refer to the much later experiments of Sir Busick Harwood, which are briefly mentioned in a footnote (? by himself) in Hutton, Shaw, and Pearson's abridgement of the Philosophical Transactions of the Royal Society in connexion with Oldenburg's paper on blood transfusion in the *Philosophical Transactions* for 1667 (p. 517). This footnote gives an account of Harwood's experiments in 1785: a dog was transfused from the carotid of a sheep, and fever resulted after twenty-four hours, though the dog survived. Harwood ascribed this fever to "the preternatural degree of stimulus occasioned by the highly oxygenated arterial blood into the right side of the heart"; he accordingly repeated the transfusion from the jugular vein of the sheep, with the expected result that the animal did not suffer the least inconvenience. Harwood satisfied himself that the blood of a herbivorous animal can be substituted for that of a carnivorous animal, and urged it for man, though apparently he did not practise his advice; but it may be noted that Cruchet and Ragot have recently transfused eighteen patients with sheep's or horse's blood, with improvement in fifteen cases. Apart from small resuscitations of the method, chiefly by Blundell and obstetricians from 1818 to 1824, and between 1860 and 1880 in Germany, and by the Obstetrical Society in London (1873), terminating with von Bergmann's monograph in 1883, blood transfusion was practically abandoned; thus in 1889, in his conclusion to three lectures on the physiology, pathology, and practice of blood transfusion, William Hunter wrote: "For practical purposes all the advantages to be gained from transfusion may be equally well and more readily obtained by infusion of a neutral saline solution of common salt." Blood transfusion did not become popular until after the description of the four blood groups (Jansky 1907; Moss 1910), which rendered grave accidents preventable. During the war a great impetus was given to its employment, and it is now a very common method, especially in America.

In considering the value of blood transfusion in the treatment of disease, there are, in the first place, some general points to be mentioned before going into the indications for its use and attempting to estimate its utility in various conditions. Like most remedies powerful for good, its employment may be attended by unpleasant or serious results, and this knowledge, combined with the difficulties of its technique in untrained hands, has necessarily tended to prevent its performance in acute cases, and to delay its adoption in chronic cases until the patient is past curative measures or even *in extremis*.

The Duration of Survival of the Transfused Blood in the Recipient's Circulation.

By the differential agglutination method Ashby determined that the transfused red cells persisted in the recipient's blood for thirty days or more, and that the period of survival is subject to much variation, the process of removal not being constant, but taking place in more or less cyclical crises; previous to this their life had been considered to be from ten to twenty-six days (W. Hunter, 1884). It might be anticipated that the duration would vary with the morbid condition of the recipient, and be shortened in haemolytic and toxic states, and longer in traumatic anaemia. But Ashby found that in four cases of pernicious anaemia the transfused cells survived as long as or longer than in persons without any blood disease. In contrast to this stability in pernicious anaemia was their rapid disappearance in myeloid leukaemia, aplastic anaemia, and haemolytic jaundice; Wearn, Warren, and Ames found that there was not any difference, as regards the survival of the erythrocytes, between pernicious and secondary anaemia, and that the average was 83 days, with 59 and 113 days as extremes. Jervell, also employing the differential agglutination method, found that in melaena neonatorum the duration was six weeks.

REACTIONS.

The incidence of post-transfusion reactions has been variously estimated, and probably the considerable divergences recorded depend on different views of what constitutes a reaction. Among 129 citrate transfusions Lewisohn observed a chill or fever up to 101° F. in 19 cases, or 15 per cent.; Souter and Duryea among 190 transfusions recorded subjective symptoms with or without fever in 49 cases, or 25.7 per cent.; Lindeman in 1914 met with an incidence of 33 per cent. out of 150, and in 1916, under improved conditions of technique, of 9 per cent. among 153 transfusions; Meleney, Stearnes, Fortuine, and Ferry among 280 transfusions noted fever, over 100° F., in 178, or 63.6 per cent.; Kordenat and Smithies record only 4 per cent. of reactions in their 106 cases, but state that, if carefully observed, all transfusions are followed by a febrile rise of degree varying from 100° to 105° F. within three hours of the procedure. Their conception of a reaction would obviously greatly reduce the reported incidence of post-transfusional reactions.

Etiology.—Very severe reactions due to gross incompatibility, to air embolism, and pulmonary oedema, should be obviated by care in typing the blood of the donors and patients, and in technique; but reactions still occur, and it seems impossible to foretell when a reaction will or will not ensue. Presuming that the typing has been correctly done, it is conceivable that the blood groups are not so sharply marked off as they appear to be *in vitro*, and that transitions ("minor" agglutinations) or even changes occur, which are sufficient to cause haemic alterations and symptoms—in other words, that the tests *in vitro* are not sufficiently delicate to separate slight degrees of incompatibility *in vivo*. It is perhaps significant in this connexion that reactions are often seen, in spite of preliminary typing, in cases of pernicious anaemia in which, from the changes in the bone marrow, obscure alterations in the constituents of the blood may reasonably be anticipated. Indeed, in severe chronic anaemia it is occasionally difficult to find a suitable donor as the tests are not sharply defined (Thalhimer), and there is some evidence that in addition to the four recognized blood groups abnormal blood groups occur in certain conditions, such as pernicious anaemia, chronic haemolytic jaundice, and malignant disease (Keynes[42]; Kolmer; Jones and Glynn). It is remarkable that the decision as to the compatibility of the donor's and recipient's blood has been determined by the behaviour of the red blood corpuscles, and that the factor of possible changes in the leucocytes

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inactive on account of its poor blood supply, to manufacture the necessary quantum of red cells (Ryffel).

To remedy toxaemia. In acute haemorrhage it has been stated that death is due to toxaemia from imperfect destruction of toxic products rather than to the diminution in the quantity of blood (Bätzner), and there is evidence that haemorrhage is followed by increased nitrogenous metabolism, and blood transfusion by a return towards the normal; fresh blood might also facilitate destruction of these toxic bodies. Dilution of the blood in grave toxaemia by transfusion would have the theoretical advantage that the dilution would not be so rapidly diminished by the passage of blood plasma into the tissues as occurs in saline transfusion, in such cases a preliminary venesection is theoretically advisable.

In bacterial septicaemia. Healthy whole blood has bactericidal properties in virtue of the leucocytes acting in conjunction with the opsonic power of the serum, the serum having little direct effect (Wright, Colebrook, and Storer).

The Indications for Blood Transfusion.

These have been based on the general grounds of the degree of anaemia present, such as a fall to one million red blood corpuscles and 20 per cent. of haemoglobin, and on evidence of haemorrhage to 2,000 c.cm. with a systolic pressure falling below 80 mm. Hg, or according to the morbid conditions and diseases, lists of which regarded as suitable for transfusion have been drawn up by various workers. Dorrance gives twelve separate groups of diseases, Libman and Ottenberg (1917) seven categories; Keynes's[42] four inclusive groups are (1) acute haemorrhage and anaemia; (2) chronic anaemia, to tide a patient over an operation or to benefit the condition, prolong life, and in the hope of cure, as in Addisonian anaemia; (3) in haemorrhagic diseases; and (4) in general toxaemia, bacterial or chemical. That absolute contraindications exist has not been satisfactorily established. In a patient apparently moribund from acute haemorrhagic anaemia transfusion may perform a miraculous transformation; in chronic anaemic states in which the underlying condition persists the circumstances are different, and in pernicious anaemia a stage may be reached when harm rather than benefit is likely to follow transfusion. Libman and Ottenberg (1917) very cautiously suggest that pneumonia or pulmonary congestion may be a contraindication, and mention an almost fatal febrile reaction (107° F.) in a child with pneumonia transfused for anaemia; but according to Bass this does not apply to pneumonia in anaemic infants. From the toxic effects of citrates on the kidneys the use of citrated blood in nephritis demands caution.

Acute anaemia due to haemorrhage is most successfully treated by blood transfusion and is a life-saving procedure, as was proved in the war, for traumatic haemorrhage; its value in post-partum haemorrhage and ruptured ectopic gestation is also acknowledged. In ruptured ectopic gestation the blood free in the peritoneal cavity has been utilized for transfusion, and in this way time spent in obtaining and testing a donor is saved; Blain and Brines, however, deprecate such retransfusion from abdominal haemorrhage. It restores the blood volume and provides the oxygen-carrying haemoglobin. A distinction between shock, in which gum solution has been advocated (Meakins) on the ground that both the blood volume and the haemoglobin are probably increased, and haemorrhage may be difficult to determine, and Keynes[42] advises blood transfusion in both.

In gastro-intestinal haemorrhage Izod Bennett disapproves of blood transfusion as it may excite fresh bleeding from an ulcer which had ceased to bleed as a result of the lowered blood pressure, and he approves of it only during laparotomy. Keynes, however, takes the opposite view. In addition it has been suggested that it may accelerate healing of a peptic ulcer by Horder (1923), who has also seen improvement in ulcerative colitis; in 1908 Hort advocated the treatment of ulcers by horse serum, which he believed favoured healing by its antiautolytic action. Usually large transfusions (1,000 c.cm.) have been given, but W. J. Mayo has advocated the superiority of small repeated transfusions over a single one. Citrated transfusions are largely employed, and as the object is to provide fresh red blood corpuscles and increase the blood volume, the question of the citrate impairing the bactericidal power of the blood does not arise.

In chronic anaemia due to repeated haemorrhages and in debility blood transfusion, in order to render feasible an operation for removal or remedy of the cause, has been employed with gratifying results, especially in gynaecological cases (Souter and Duryea; Williamson), and also in gastro-intestinal haemorrhage. In these cases it may be necessary to repeat transfusion during and after the operation. When the condition is not urgent Libman and Ottenberg recommend an interval of two days between the preliminary transfusion and operation.

As a prophylactic against post-operative shock transfusion has been much employed; Blain and Brines adopt this course in nearly all their goitre cases, and in infants with pyloric stenosis it has reduced the mortality (Cross).

In haemorrhagic diseases and conditions with the loss of blood so continuous or repeated as to become serious, transfusion is useful by supplying the missing thrombogenic factors, such as the blood platelets in purpura haemorrhagica. Paradoxical as it may appear, the addition of sodium citrate as an anticoagulant does not interfere with the haemostatic effect of the blood transfusion.

Purpura haemorrhagica is characterized by bleeding from mucous surfaces, a diminution in the number of blood platelets from the normal 250,000 to 40,000, 5,000, or even less, in the shed blood (thrombocytopenic purpura), a prolonged bleeding time often exceeding two hours (Dukes), but often no abnormality in the coagulation time. Though thrombocytopenia is usually regarded as confined to purpura haemorrhagica and to be one of its essential features, this has been vigorously denied by Tidy. Blood transfusion, which had sometimes to be repeated, as the life of the platelets is said to be four days only, was formerly the chief form of treatment, but recently splenectomy has come into vogue, and has been found to give more uniformly successful results (Vincent[77]); Poynton, Thursfield, and Paterson regard transfusion as dangerous, but Tidy recommends transfusion before splenectomy.

In haemorrhagic disease of the newborn, melaena neonatorum, the performance of blood transfusion presents technical difficulties, unless the superior longitudinal sinus, the external jugular, or the umbilical vein (Sidbury) be utilized. Citrated blood exerts a styptic effect, and according to Torii is the simplest and safest method; whole blood has been given hypodermically. In most cases a single transfusion is sufficient. Very encouraging reports of its efficacy have been made by Vincent,[78] who had four deaths only among thirty-one cases, and by others (Laurie; B. Robertson; F. W. Robertson; Eyres), and it not only arrests bleeding but augments the depleted circulating blood.

Haemophilia.—Although the blood platelets are never diminished in this disease, the haemostatic effect of the blood transfusion is ascribed to the supply of blood platelets, and as their life is about four days this influence is short. Minot and Lee's experience is that, in order to supply a sufficient number of platelets, fairly large transfusions are desirable; Keynes,[42] on the other hand, states that 100 c.cm. is sufficient for the haemostatic effect. It is useful both as a prophylactic to prevent bleeding during a necessary operation and to arrest haemorrhage from slight injury; as its effect is transient further transfusions may be required, especially during the healing of a wound. In the severe anaemia due to loss of blood transfusion also does good service.

Jaundice.—From the prolonged coagulation time and tendency to bleed which, from the general oozing, becomes such a serious factor in operations on deeply jaundiced patients, blood transfusion appears to be the most effective prophylactic, but is not constantly successful and its effect is transitory. In some cases of deep jaundice the coagulation time is not abnormal and bleeding does not occur; as the coagulation time can sometimes be made normal by the administration of calcium, estimation of the coagulation time will determine whether or not blood transfusion is necessary. Recovery in grave familial jaundice of the newly born has followed venesection and transfusion (Hart). Its employment in chronic haemolytic jaundice is open to

and platelets has been almost entirely neglected. Doan has observed in some instances in which the bloods, as tested by the ordinary typing method, were compatible, that there was well marked destruction of the leucocytes, and that there was a greatly increased amount of cellular debris in the plasma, which distinguished it from the leucopenia of protein shock. In order to avoid reactions due to incompatibility between the blood plasma and the leucocytes, he advises and describes a method of testing for this before transfusion.

Reactions are more often seen after large transfusions than after small ones of 200 c.cm., and after repeated injections than after the first. But a fatal result has occurred after a single transfusion (Carrington and Lee). The addition of anticoagulating agents has been said to increase the incidence of reactions; thus Minot and Lee found reactions more frequent after citrated than whole blood in the proportion of 35 to 15; Unger (1917) febrile reactions in 60 per cent. of citrated transfusions as against 3.5 in 165 ordinary blood transfusions; and Lederer 49.5 per cent. reactions in 49 citrated infusions as against none in 40 transfusions of unaltered blood. Possibly the citrate renders the red cells more fragile (Unger, 1921), and so favours haemolysis. Keynes,[44] however, while admitting the possible influence of citrated transfusions in causing reactions, regards their occurrence as of little importance and as greatly overweighed by the advantages of the method.

Influence of Repeated Transfusions.—Many clinical observers (Keynes[43]; Bowcock; P. W. and M. C. Clough; Souter and Duryea) have noted that after repeated transfusions, from donors originally compatible, the patients are likely to show reactions, and it has been suggested that anaphylactic shock from sensitization of the patient had occurred, and that therefore it may be advisable to change the donor. In 1917 Libman and Ottenberg insisted that after repeated transfusions from the same donor agglutinins and haemolysins for the donor's red cells develop and that it is therefore essential to repeat the preliminary blood tests before each transfusion. Peyton Rous and Oswald Robertson have proved that in experimental rabbits repeated transfusions from donors originally compatible lead to the formation in the recipient of antibodies (iso-haemoagglutinins and haemolysins) which cause massive agglutination of the red cells and even fulminant haemolysis *in vivo* with resulting anaemia.

Forms of Reactions.—Kordenat and Smithies have described three kinds of reaction after transfusion: (1) Acute and fulminant response due to agglutination and haemolysis, coming on immediately. These should be prevented by careful preliminary typing of the donor's and recipient's bloods. (2) Delayed or proteolytic response coming on from one to twelve hours after transfusion, and ascribed to bacteriolysis or to protein cleavage of damaged tissues at an infective focus, and not to haemolysis. This reaction is regarded rather in the light of a conservative process, inasmuch as the recipients are often benefited by it—just, indeed, as they are after protein shock therapy; death, however, is not unknown. (3) Systemic or constitutional reactions which, like the last group, are not haemolytic as there is not any evidence of blood destruction. The explanation of these frequent febrile reactions is obscure; Kordenat and Smithies again mention bacteriolysis and proteolysis, and also suggest that the reactions are analogous to protein shock and not necessarily specific. Lindeman (1916), however, argues that they are due to haemolysis occurring in the body, but not shown by the preliminary tests or, unless considerable, by haemoglobinuria or porphyrinuria; he compares it with the fever and rigor in malaria after haemolysis, and quotes some experiments showing that fever is produced by the injection of haemoglobin. There is, however, little clinical evidence that haemolysis alone does much harm; for example, in congenital haemolytic jaundice in which, though icterus is more obvious than in the minor reactions after blood transfusion, there is little in the way of acute symptoms; Karsner, while pointing out the lack of proof that haemolysis alone is responsible for these reactions, admits the possibility that accompanying the haemolytic process toxins capable of causing serious results may be formed. Meleney, Stearnes, Fortuine, and Ferry, by examination of the urine for urobilin and haemoglobin, failed to find any constant evidence of such haemolysis, and therefore could not accept this explanation for all the cases. Sodium citrate in citrated blood has been thought, either by causing haemolysis or independently, to be responsible for reactions. Other conceivable causes are similar occult agglutination of the transfused erythrocytes—although the preliminary tests did not show it—damage to the red cells or changes in the plasma protein during the process of transfusion, the formation of toxic split-protein, agglutination of the leucocytes, and changes in the platelets associated with incipient coagulation (P. W. and M. C. Clough). It is, of course, possible that these minor post-transfusion reactions may be due to different factors in different cases.

THE WAYS IN WHICH BLOOD TRANSFUSION MAY BE THOUGHT TO DO GOOD.

In emergencies it may merely make good the deficiency of the blood after acute haemorrhage, such as post-partum or traumatic, and some of the best results in the way of saving life have been obtained in such cases of haemorrhagic shock. The fear that by increasing the arterial pressure it may induce bleeding from the original source of haemorrhage (I. Bennett) is perhaps more than counterbalanced by the increased coagulability of the blood. In four observations Eyster and Middleton found that the rise in arterial pressure was slight and transient, the maximum being 20 mm. Hg in both the systolic and diastolic pressures.

In recurrent or chronic haemorrhage it may act as a styptic by supplying fibrinogen and thereby increasing the coagulability of the blood. But here its effect is palliative rather than curative, as the underlying cause is not removed.

In chronic anaemia, by supplying the deficiency of red-blood corpuscles. Here the problem is not so simple as in acute haemorrhage, for the etiological factors, such as infection, malignant disease, and disorder of the blood-forming organs, persist and must be taken into account. It may, however, enable a very anaemic patient, who otherwise could not, to stand an operation for the removal of the underlying cause of the anaemia, such as bleeding uterine fibromyomas (Williamson); in such cases transfusion may be done both before and during the operation.

To supply substances in which the blood is deficient, such as antibodies in acute infections and functionally active haemoglobin as in CO poisoning in which it is fixed by the CO.

To act on the bone marrow. In disordered conditions, such as leukaemia, it might, by supplying it with healthy blood, correct the disturbed functional activity, for it is obvious that the bone marrow must be efficiently nourished if it is to discharge its function in a normal manner. In chronic anaemia, especially pernicious or Addisonian anaemia, transfusion is often said to act by stimulating the bone marrow, because the improvement may be out of proportion to the amount of blood transfused; Hurst, indeed, suggests that healthy blood contains a hormone which specifically stimulates the bone marrow, and also that it may contain antibodies. On the other hand, loss of blood is in itself a stimulant, haemoglobin has not been proved to stimulate the bone marrow, and stimulation pure and simple might be thought to be harmful by tending to exhaust an already overworked bone marrow, as in ordinary pernicious anaemia. Theoretically it might also appear likely to be more useful in some of the cases grouped under the heading of aplastic anaemia, in which the bone marrow is paralysed by some "brutal" infection or toxic factor, such as benzol, than in ordinary pernicious anaemia, in which the bone marrow is already hyperplastic; but in benzol poisoning the results of transfusion have been very disappointing according to McClure, who, however, reports one cure. It has been suggested that the transfused cells give the bone marrow a rest, after which it is able to respond to the stimulus, which previously it could not do (Opitz; Isaacs), and also that transfusion provides sufficient oxyhaemoglobin to enable the hyperplastic bone marrow, which had been comparatively

nephritis recovery followed venesection and transfusion (Bowers and Trattner). Cross found it beneficial in intestinal toxaemia and in that following burns in children.

Debility.—In premature and congenitally weak infants who lose weight in spite of proper care, Guéniot obtained good results by transfusion of 10 to 20 c.cm. into the superior longitudinal sinus. Cross confirmed these good results in debilitated infants. In patients who, without any obvious cause, hang fire after operation, Brines found that improvement followed transfusion.

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II.—G. LOVELL GULLAND, C.M.G., M.D., F.R.C.P.E.,

Professor of Medicine and Clinical Medicine in the University of Edinburgh; Senior Physician to the Royal Infirmary, Edinburgh.

I HAVE been practising transfusion or seeing it practised for over thirty years, mainly in pernicious anaemia, but of late years in other conditions with increasing frequency, and have reached definite conclusions as to its value in several of these. I cannot help thinking that the duration of survival of the transfused corpuscles is overstated by the American and Scandinavian authors quoted by Sir Humphry Rolleston. There are many possibilities of fallacy in the differential agglutination method—we inject many other things besides the corpuscles in transfusion—and in transfused cases which do not do well, even though there is no haemolysis, and even in some which ultimately do well, the blood counts after transfusion do not bear out the view that the corpuscles survive so long. The rule is to find an increase of corpuscles, but it is exceptional in the type of case of which I am speaking for the increase to be maintained for more than a few days. The count then drops back to its previous level, or below it if the case is doing badly, and it is, I think, permissible to conclude that the transfused corpuscles have largely disappeared from the circulation. I have followed these cases many times by daily counts, and daily examination of films, in the hope that I might be able to recognize some at least of the transfused corpuscles, or make out some change in the blood picture as the result of the transfusion. The transfused corpuscles are never recognizable; I think because there are, even in the worst pernicious anaemias, a sufficient number of corpuscles of normal appearance to mask the new ones, and the blood picture as a whole only changes if the disease is getting worse or better in the ordinary course.

I am impressed, in looking back on my earlier cases, by the luck which I seem to have had in escaping reactions in the days before blood grouping was known. I can recall only two, neither fatal, out of a large number of cases. I have not always been so fortunate of late, even when the grouping was most carefully done. A few days ago a patient suffering from carcinoma of the stomach, who was very anaemic, was transfused, with a view to operation, from a source which was apparently absolutely compatible. There was a fairly severe reaction with marked haemoglobinuria, and, as far as I could judge from the count, a complete loss of the transfused corpuscles. Not long ago I had a very severe reaction, threatening death, in a pernicious anaemia during transfusion with a blood which I had satisfied myself was compatible. In a sense I was prepared for trouble in this particular case, as I have never seen anyone who was so intolerant of drugs and remedies of every kind. He lived for about a year after the transfusion and gave me a useful lesson on the ups and downs of an untreated case. I have passed through all the various fashions in the methods of transfusion, whole blood and the various anti-coagulants, and, so far as the effect on the patient is concerned, I do not think there is any great difference. The citrate method is certainly the easiest for the donor and the operator. Probably I should have used transfusion even more often than I have were it not for the difficulty of getting suitable donors. I am under a deep debt of gratitude to a patient suffering from a polycythaemia who has many times given her blood for my cases. She is fortunately a universal donor, and her corpuscles have done good to many, abnormal though they may be in themselves, while the repeated bleedings have kept her in much better health

discussion, as it is hardly likely to effect more than temporary benefit; but it may be of value in connexion with splenectomy.

Pernicious Anaemia.—The value of blood transfusion in Addisonian or pernicious anaemia has been very variously estimated, and the irregular course of the disease and the tendency to spontaneous remissions make judgement difficult. Some regard it as undoubtedly of great value (Keynes[42]; Anders; Stetson; Hurst), others as merely a means of obtaining temporary improvement (Panton), and others as so inefficient and dangerous that they have abandoned it (Landis). It has been definitely stated to bring on a remission, though the remissions are not thereby prolonged. In Anders's collection of 362 cases a remission was initiated in 204, or 56.3 per cent. Libman and Ottenberg regard it as the best remedy for, but never curing, the disease, and Bloomfield, from an analysis of 57 cases, agrees that in patients who are not in a condition refractory to all forms of treatment transfusion is more often followed by a remission, but that the remission is not thereby lengthened or life prolonged. Recent acute cases seldom respond to transfusion; cases without remissions are rarely benefited, and patients over 60 years of age often fail to show improvement (Archibald). Chronic cases with remissions are more likely to benefit. Transfusion should be employed in early and not left to late stages, when not only may it fail to bring about a remission, but it may be followed by a serious reaction and even death. Small (200 to 500 c.cm.) rather than large transfusions seem to be more suitable, and are often repeated frequently; in 1924 Hurst reported very promising results from 20 to 25 c.cm. injected on every other day. It has been suggested that if benefit does not result from a transfusion another donor should be utilized; the change of donor has also been recommended in order to avoid anaphylactoid shock. As already mentioned, reactions are rather frequently noticed in pernicious anaemia; after repeated transfusions from the same donor, especially when there is an interval of three to six weeks between the first and a second transfusion, the reaction has naturally been regarded as anaphylactic (Böttner). Transfusions which are followed by improvement have been found to produce a fall in the amount of bilirubin in the plasma, either immediately, or gradually during two or more weeks (Broun, Ames, Warren, and Peabody).

Reed and Wyckoff, who, like Hurst, regard subacute combined degeneration of the cord as closely allied, add sprue to this group and recommend transfusions.

In their category of *anaemia gravis* of children Poynton, Thursfield, and Paterson include not only cases commonly labelled "aplastic anaemia," but others; as a whole these cases are regarded as occupying in children's diseases the place of, though presenting many differences from, pernicious anaemia in adults. In this condition transfusion is regarded as dangerous.

Anaemias other than Addisonian.—Infantile splenic anaemia, or von Jaksch's anaemia pseudo-leukaemica infantum, has a tendency to undergo spontaneous cure, Thursfield putting the recovery rate at 65 to 70 per cent. In this condition transfusion has been said to have a more dramatic and lasting effect than in any disease of children (Bourne). In acute febrile anaemia, described as a new disease by Brill, who refers to two other cases (Macintosh and Cleland; Moschcowitz), there is pleiochromic anaemia with hyaline thrombosis of the terminal arteries and capillaries. In Brill's patient, who had one million reds, 5,000 leucocytes (polymorphonuclears 61, lymphocytes 36, eosinophils 2), and blood sterile on culture, recovery followed ten transfusions of 300 to 500 c.cm of blood.

Leukaemia is due to a riotous growth in the leucoblastic tissues, mainly of the bone marrow, and discussion whether or not it should be regarded as allied to sarcoma or infection has lost much of its point in the light of Gye and Barnard's description of a cancer parasite. Transfusion has been employed with two objects: (1) symptomatically to stop haemorrhages, and (2) in the hope of exerting a curative influence.

(1) To prevent haemorrhages. In three cases of acute leukaemia Libman and Ottenberg (1915) failed to obtain any positive result, but in one chronic case transfusion was followed by cessation of the haemorrhages.

(2) The attempt to correct the morbid process in the leucocyte-producing tissues by providing normal blood, or by stimulating them in the right direction, or by supplying a hypothetical antibody, is justifiable in such a desperate disease, and in a few instances has appeared to exert a beneficial effect. There is very little evidence that acute leukaemia is benefited by blood transfusion; in an interesting case of microlymphoidocytic leukaemia lasting four months twelve blood transfusions probably prolonged the course of an illness which is usually of very short duration (Fineman). In chronic leukaemia, in which the course is not so steadily downhill, there may appear to be more in the way of results from transfusion. Thus out of five cases of chronic lymphoid leukaemia given one transfusion by Libman and Ottenberg (1915) four showed clinical improvement and a remarkable blood change, the picture becoming normal for a week to a year. Dr. Herbert French tells me that repeated transfusions certainly improve the patients, especially when they are started early in the course of the disease.

Acute Septicaemias.—The general opinion is adverse to blood transfusion in acute haemic infections, as they fail to benefit, and may do harm from the formation of abnormal agglutinins and haemolysins. Eardley Holland has abandoned it in acute puerperal infections. It has been thought that transfusion may increase the patient's general resistance, possibly because the blood may happen to contain specific antibodies, as in a donor who has recently recovered from the same disease, a condition which is imitated in Wright's immuno-transfusion, when a donor is specially immunized against the patient's infection. According to Colebrook and Storer the bactericidal properties of whole blood for streptococci and staphylococci are impaired by the addition of citrates, and therefore citrated blood should not be employed in immuno-transfusion. Walsh and Harmsworth, while confirming Colebrook and Storer's conclusion that defibrinated blood is superior in bactericidal power to citrated blood, find that the bactericidal power of the blood is enormously increased by coagulation, that citrates inhibit the growth of staphylococci in the blood, and that citrated defibrinated blood has a greater bactericidal power than defibrinated blood. With unmodified blood Stetson obtained cures in 31 out of 57 cases, and reported 10 recoveries out of 19 cases of *Streptococcus haemolyticus* infection; he insists on the importance of early and repeated transfusions. Immuno-transfusion proved successful in cases of streptococcic septicaemia reported by Fry in 1920. In malignant endocarditis Libman and Ottenberg (1917) obtained brilliant temporary results, but the 7 cases reported by Stetson all proved fatal. Horder (1926), though critical, considers it worth a trial, as improvement sometimes occurs, and appears to think better of it than of immuno-transfusion, which, however, has in exceptional instances been followed by recovery (Wordley). Thayer treated a case of streptococcic endocarditis for six months by repeated immuno-transfusions, but although the result did not appear superior to that of simple transfusion, he considers it worthy of further trial, and no doubt it is still in a stage awaiting final decision.

In chronic infections it has been employed with benefit in various conditions (Nathan; Brown; Hansen).

Intoxications.—In carbon monoxide poisoning the introduction of functionally active red cells to carry oxygen while the recipient's haemoglobin is fixed by CO has been long advocated and supported by experimental observations (Burmeister). A preliminary venesection has been recommended, and with this proviso Libman and Ottenberg (1917) spoke highly of it. J. S. Haldane, however, cannot see any scientific reason for the employment of preliminary venesection or for transfusion of blood. In illuminating gas poisoning other toxic factors may be concerned, and it has been thought that this may justify venesection.

In uraemia and diabetic coma blood transfusion has rarely been performed, and in diabetic coma insulin is, of course, the proper treatment. Blair Bell obtained a cure in puerperal eclampsia after one blood transfusion of 500 c.cm. Blood transfusion has been regarded as the best diuretic in oliguria with impending anuria (Martin); in a case of anuria following decapsulation for acute

ceased and there was a definite improvement in the blood, but during this month the bleeding started again, and I propose now to give him a preliminary transfusion and then to give a large quantity during the course of a splenectomy. I have seen no bad results from transfusion in this condition.

Transfusion, if it is used discreetly, is certainly one of the most valuable remedies in a number of diseases, and is sometimes the only one which will save our patients.

III.—RENÉ CRUCHET, M.D.,

Professor of Pathology and General Therapeutics in the University of Bordeaux.

TRANSFUSION OF BLOOD FROM ANIMAL TO MAN.

General Considerations.

IT is difficult to speak about transfusion of blood without recalling the name of Harvey, whose well known book on the circulation of blood, published in 1628, inspired by this immortal discovery therapeutic hope till then unimagined. Harvey made for the first time this fundamental observation: "It is evident that the principle of contagion which has reached part of the body has gone back to the heart with the circulation of the blood, and can from there infest all the body."

If the circulation explains the disease, it can also explain the remedy. From this sprang Harvey's other remark: "Is it not reasonable to say that the veins absorb the substances and introduce them in the blood?"

Thus some bold experimenters, such as the English scientists Christopher Wren, Boyle, and Clarke, between 1656 and 1660 injected into the veins of animals, and even human beings, opium, milk, and broth; it was the so-called "infusory surgery." But when they began to think about injecting medicines, they would naturally also have been expected to think of injecting blood: it was the "transfusory surgery." At first it was the transfusion between animals of the same species, then of different ones. Let us specially note the memorable experiments at Oxford in 1666, made by Richard Lower from dog to dog, and those of Edmund King and Thomas Coxe in 1667 from calf to sheep. These experiments having fully succeeded, the method was tried on men, and honour is due to the Frenchman, Denys of Montpellier, in 1667, who, the first in Paris, employed it in four human subjects. The successes obtained were remarkable; they showed in the most convincing way that the transfusion of lamb's or calf's blood to man was possible, as Richard Lower and Edmund King proved in the same year with full success.

Notwithstanding, transfusion was soon forgotten, and it may be said that no more attention was paid to it, apart from some interesting experiments, till about 1860. At that time Dr. Oré, professor of physiology at the School of Medicine of Bordeaux, began a series of remarkable studies on this subject, which he pursued all his life; they are published in his work, which became classical, and of which the second edition was published in 1876.

Oré, defender of the transfusion from animal to man, was able to show by experiments and with precise statistics that this way of transfusing blood was superior to man-to-man transfusion. Notwithstanding, the transfusion from animal to man, as from man to man, was still beset with practical difficulties, and accidents were too frequent. The most favourable statistics, in the method of animal to man, gave more than 16 per cent. fatalities, which was not at all encouraging; moreover, the reactions provoked by transfusion were often very acute: rigor, pyrexia, acceleration of the pulse, dyspnoea, sweating, lumbar pains, haematuria, headache, vomiting, and collapse.

Asepsis and antisepsis being unknown at that time, it was necessary also to take into account quick coagulation of the blood, which, as Oré had observed, might cause embolism.

It was only in 1917 that, following the works of Hédon and Jeanbrau of Montpellier, Agote (Buenos Aires), and Lewisohn (United States), it was found possible to stop the blood from coagulating by sodium citrate, rendering it possible for transfusion to be adopted practically. In the meantime, after Pasteur's and Lister's work, surgery had been completely transformed.

Clinical Observations and Results.

The moment seemed to have come to take up again, on a modern basis, the ideas of Oré—the transfusion of blood from animal to man. We have undertaken this study since 1921, and here are the results. We began by making numerous experiments of the transfusion of blood between animals of different species. We established that it was possible, without accident, to inject into dogs the citrated blood of sheep, ox, or horse in considerable amounts, proportional to the weight of the animal—100, 200, 300, and even 400 c.cm., which represent transfusions equal to two and three litres of blood for a man.

Encouraged by these observations, we then carried out the transfusion of the blood of sheep and horse to man, but in small doses.* Blood was taken with aseptic precautions from the animal at the level of the jugular vein and received directly, either in a big glass syringe or in the apparatus of Jeanbrau, the two receivers having previously been filled with 10 per cent. sodium citrate solution (1 c.cm. for 100 c.cm. of blood). The blood was immediately injected into a vein of the arm of the treated patients. The quantity has varied between 25 and 40 c.cm. of citrated blood; once we went up to 80 c.cm. of sheep's blood. The transfusion was always conducted slowly (lasting about two to four minutes in the first cases, but still more slowly in the later ones).

Injections of sheep's blood have been given to eight patients (four tuberculous, one hemiplegic, one anaemic, one asthenic, one encephalitic); it has been repeated once in two cases, which brings the total to ten transfusions.

Transfusions of horse's blood have been used for twelve patients (nine tuberculous people, one insane, one septicaemic, one pyaemic); two of these received two injections, which brings the number of transfusions made to fourteen.

These transfusions of blood from the sheep or horse provoke very often the following reactions: pains in the loins (the most frequent phenomenon, 16 times in 24 cases), acute pain in the loins, "waist pains" radiating to the pubis, bladder, and abdomen, and provoking sometimes micturition and evacuation. Twice there was vomiting. More infrequently rigors were observed, often slight, but sometimes violent, with shivering and dyspnoea, followed by sensations of heat and abundant perspirations, a slight elevation of temperature, with parallel acceleration of the pulse. Twice we observed slight fall of temperature with lessening of the arterial tension; in two cases headache occurred. These different phenomena disappear quickly in about a quarter to half an hour.

Twice the urine was red and the reaction of Meyer positive (presence of haemoglobin without red cells). Three times urobilin was found. The presence of albumin in small amount (0.1 to 0.2 gram per litre) is common. These urinary changes disappear in twenty-four hours. In two cases we have observed nettle-rash. The examinations of the blood and leucocytes in the transfused patient have given us contradictory results; but most frequently there is an increase in the number of the red cells and leucocytes after the transfusion.

Once in a case of pyaemia—considered desperate, it is true—sudden death followed the introduction of 1 to 2 c.cm. of the blood of a horse. Except in this case and in two others which remained unchanged, the state of our patients improved, and they have even asked urgently for repeated transfusion.

These results seemed to us most interesting; they show in the most evident way that the transfusion of blood from animal to man is possible with modern methods without bringing on more accidents than transfusion from man to man. It is clear that the small accidents which we have observed are exactly identical with those which we have seen in the transfusion of human blood, in the course of which sudden death may occur.

* These are our first results, communicated to the Medical Congress of the Royal Institute of Public Health at Plymouth, June 2nd, 1922 (*Lancet*, July 15th, 1922, p. 140). Cruchet and Ragot, *Paris Médical*, January 27th, 1923, pp. 82, 85; Ragot, *Thèse de Bordeaux*, December, 1922.

than she was previously. Following her example another patient with polycythaemia, a male and also a universal donor, has begun a useful career in that direction.

Sir Humphry's discussion of the ways in which transfusion may do good is excellent, and I have nothing to add to it from the general point of view. But I should like to consider more fully the case of pernicious anaemia. It is now so common a disease that the consideration of transfusion must come up frequently to every physician. My own experience has convinced me that arsenic given by the mouth is so immensely superior to all the other methods of treatment put together that every case should have a proper trial of that remedy; and, further, that cases that will not do with arsenic by the mouth will seldom respond to arsenic given in any other way or to any other form of treatment. I have seen many cases, apparently desperate, respond brilliantly to arsenic—of course conjoined with rest, proper diet, and nursing, and the treatment of their individual symptoms. I am always inclined, therefore, to try this first, though sometimes the cases are so bad that it is obvious that time is an important factor, and we are driven to a transfusion at once, generally with a justification of the bad prognosis already given. The blood count is always to be considered. A patient with a red count of 1,000,000 cells per c.mm., and a haemoglobin percentage of, say 25, is not in immediate danger from the anaemia. His declension to that level has been gradual, and he is in a very different case from the patient whose count has fallen suddenly to that figure as the result of haemorrhage. In the first case the organs have become accustomed to their anaemia; the patient may be in danger from his heart, his kidneys, his alimentary tract, or from intercurrent disease, but if these do not affect him specially, there is time for treatment with arsenic. Cases with evidence of cardiac failure, with chronic kidney mischief—which is much more common in pernicious anaemia than is usually recognized—with marked fever, whether apparently causeless or due to some complication, and patients with severe hepatic or gastric disturbance, are not good cases for transfusion.

Here I may interpolate a little theory. Pernicious anaemia is a toxaemia, caused by various poisons, which, so far as the bone marrow is concerned, have the common effect of interfering with the normal normoblastic reproduction of red corpuscles so that it passes more or less completely, but never entirely, into abeyance, and the marrow falls back on the megaloblasts for blood production. All, or at any rate most, of these toxins act in a cyclic manner, producing anaemia at first gradually, then more rapidly, but at last either exhausting themselves or producing antibodies which counteract them. When this point is reached, if the patient has sufficient vigour the normoblastic function resumes its work and reproduces a more or less normal blood, sometimes with astonishing rapidity, sometimes more slowly. If the source of the toxaemia is not removed the cycle may be repeated on several occasions. Very few patients come under competent observation until their blood has run down to a low level, and in many cases, though not in all, we cannot stop the process of declension by transfusion or anything else until the toxic process is exhausted. In every case the question which has to be answered is, "Can the patient live long enough to overcome or exhaust the toxin, and has he sufficient vigour to recover a normal blood-formation when the toxic process is over?" In no two cases is the answer to that question arrived at in the same way, for it depends on previous history, duration of the disease, presence or absence of general or special degenerative change, and so on, in addition to the actual blood picture and the symptoms of the disease itself. The great majority of cases of pernicious anaemia recover from their first attack, with or without treatment, and often in spite of wrong treatment. It is only in cases of exceptional severity that transfusion has to be considered in a first attack; usually it is in second, third, or even fourth attacks that it is considered and used. Its real value is to help the patient round the critical corner, to raise his low vitality, exhausted by toxaemia, and give him a chance to recover himself. It is not curative in the sense in which arsenic is curative. The transfused blood may contain antibodies, but as it is not known what the toxins are which cause pernicious anaemia, it is mere chance whether the antibodies injected are in any way related to the toxins. It is, indeed, improbable that they will be, for we try to select as donors young healthy people who are not likely to carry the antibodies required by the older degenerated people who are the usual subjects of pernicious anaemia. The supply of healthy corpuscles and healthy plasma must be of value, and while there is in a sense no object in stimulating a marrow which is already hyperplastic, it is to be remembered that the hyperplasia is one of megaloblasts and not of normoblasts, and that it is quite possible that the healthy blood may stimulate the more or less dormant normoblasts and enable them to start proliferating afresh. It is much to be regretted that we know nothing of the condition of the marrow in the remission stage—we do not know whether the hyperplasia of megaloblasts disappears or not; when patients with pernicious anaemia die in the stage of remission, as they do occasionally, it is practically always when they are out of observation.

To sum up, transfusion is most useful, in my experience, in uncomplicated cases which are lagging, and failing to raise their blood count by their own and our efforts. If we had an unlimited supply of donors it might be worth while to transfuse every case when it first comes under observation, but I doubt very much whether results would be any better than at present. If a patient does not respond to one transfusion, a second will rarely help him. I remember one case in which the patient turned the corner with a transfusion, and went away, comparatively well, to another city. He and his friends were so much impressed by the result that they insisted on repeated transfusions at short intervals, until the blood was pushed up to normal, with the unfortunate result that his heart apparently could not stand the strain of repeated transfusion, and he died of cardiac failure.

The value of transfusion in acute haemorrhage and before and during operation is so well established that I need not emphasize it. In leukaemia it is necessary to distinguish sharply between the acute and chronic forms. At one time I treated several acute leukaemias in succession by transfusion. In no case was there any improvement, either clinically or in the blood picture, though there were no severe reactions; the course of the disease did not seem to me to be altered in any way, and I have not used the method recently in these cases. In the chronic leukaemias, granular and non-granular, the only indication I have adopted for transfusion has been intractable haemorrhage which would not respond to other treatment, and I have twice had good results. I am doubtful whether transfusion in the ordinary course is likely to give such good results as radiation.

In aplastic anaemia, owing to the hopelessness and inefficacy of every other form of treatment, we are sometimes driven to a transfusion. But it is never of any service in the acute forms, and sometimes causes sharp reactions; in the more chronic forms, in which I have sometimes transfused repeatedly, there was no effect beyond the short and temporary relief from the increased number of corpuscles.

During the past year my attention has been specially drawn to haemophilia. The starting-point was the admission to the ward of a haemophilic in whom the removal of several teeth had become urgent. This led to the study of the effect on his coagulation curve of all the substances reputed to be useful, and ultimately to the bringing into the ward of all the haemophilics and suspected haemophilics that could be found. I do not propose to foreshadow the results of this study—it would take too long to do so; it must suffice to state that transfusion was found to bring the coagulation curve nearer to the normal, and to do so more rapidly than any other method, while repeated transfusions seemed to start the patients off on a higher plane of health and resistance.

I have not yet made up my mind about the value of transfusion in purpura haemorrhagica. Some cases have done well with it, and have had no recurrence for long periods, but I have a patient at the moment who was transfused in the beginning of May. The haemorrhages

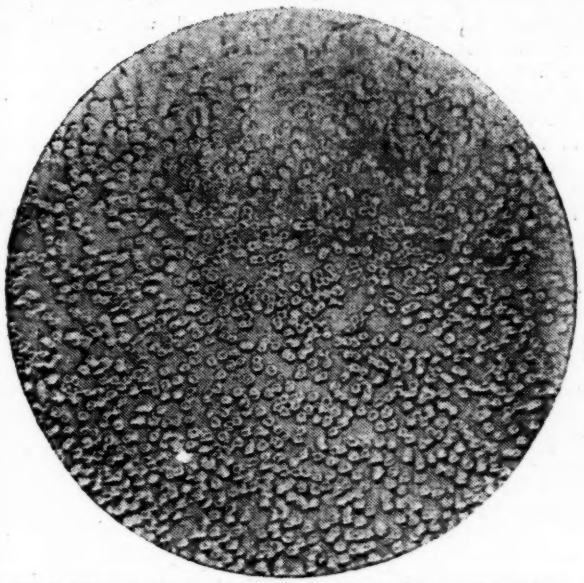

FIG. 3.—Human blood and blood of guinea-pig. No agglutination.

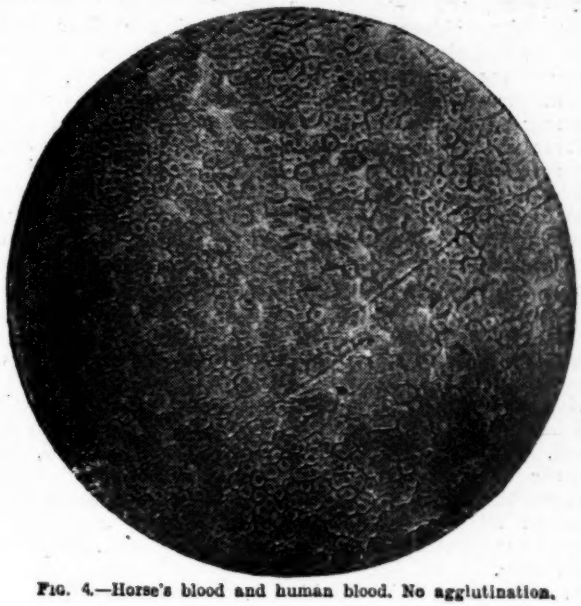

FIG. 4.—Horse's blood and human blood. No agglutination.

FIG. 5.—Dog's blood and horse's blood. Positive agglutination.

FIG. 6.—Human blood and colloidal iodine. Positive agglutination.

We were able to transfuse dogs with 100 to 200 c.cm. of this cellular debris in equal parts with physiological serum without perceiving the slightest accident. The introduction of cellular remains resulting from the haemolysis of red cells is not absolutely dangerous if the conditions of the rate of flow are fulfilled as we have indicated them.

Our experiments with particles of stone, which can be as large as from 15 to 20μ across, are still more typical. So as to avoid accidents it is necessary to decrease the rate of flow in proportion to the number of particles in the injected serum. Thus a transfusion of 400 c.cm. of physiological serum containing 0.15 gram of stone has been made in a dog of 8 kilos at the average speed of 12 c.cm. a minute; but this rate was slackened to 3 c.cm. a minute for a transfusion of 130 c.cm. of serum containing 1 gram of stone.

The animal was killed five days later to determine what had become of the injected particles; they were found again everywhere in the blood, kidneys, lungs, and liver.

(c) *Haemolysis.*

We have shown that haemolysis is an independent phenomenon of agglutination. This haemolysis occurs nearly always in cases of transfusion of blood from animal to man. It is experimentally provoked in the transfusion of blood from horse to rabbit or to dog; it occurs in mixtures whether *in vitro* or *in vivo*. This slight haemolysis does not result in any obvious accidents when the rate of the transfusion follows exactly the preceding established rules. The examination of the urines shows the presence of traces of albumin, with or without casts; the reaction of Meyer is positive. The presence of red cells is inconstant. There may be traces of urobilin. This urinary syndrome does not last a long time and its prognosis is good. It shows itself in the hours which follow the transfusion, reaching its maximum the next day and disappearing definitely after forty-eight hours.

Transfusion Accidents due to too Rapid Flow of Blood.

In contrast with what is believed, transfusion can be performed without any accidents, using homologous or heterologous blood, provided that the rules concerning the flow of the transfused blood are accurately followed. But if these simple rules are not followed and the injections are hurried we shall see these accidents happen, and the more rapid the transfusion the more severe they will be. When it is very rapid the animal quickly collapses and falls on its side in a few minutes. The beating of the heart becomes imperceptible, the rhythm of breathing is irregular,

But cannot these accidents, slight and temporary as they are, be avoided? That is what we have studied in the second part of our investigations.

Essentials in Correct Transfusion.

The great number of experiments which we made led us to the conclusion that bad technique was the usual cause of accidents in transfusion. The error is the too rapid transfusion, especially at the beginning of the operation. Here are the results of our observations.[1]

1. Whether the transfused subjects receive homologous or heterologous blood, the reactions seem exactly the same, and depend upon the rapidity of the flow.

2. The rapidity of the flow of the blood must be closely watched, if immediate or remote accidents, described long ago as occurring in transfusion, are to be avoided.

3. It is principally the flow of the first cubic centimetres which must be narrowly observed; for in the course of the transfusion the flow can be increased without resulting in any accidents. The flow goes on, following the oscillations of which we have established the curve.

4. This curve is divided into three successive periods, as can be distinguished in the following experiment; a dog of 13 kilos into which is transfused 260 c.cm. of a mixture of equal parts of citrated horse's blood and of physiological serum.

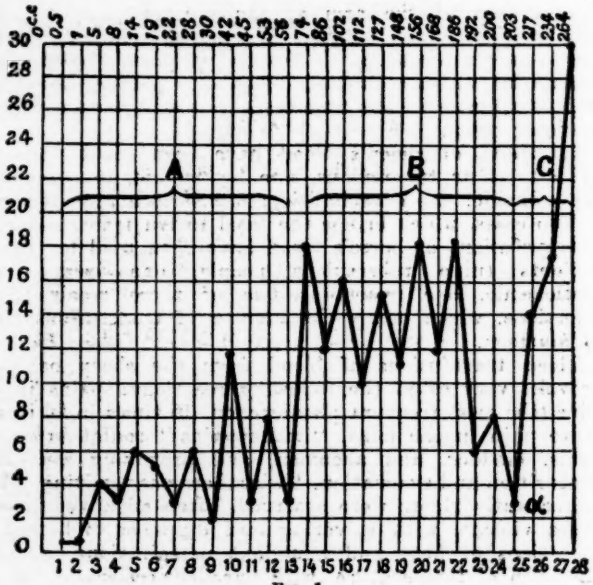

FIG. 1.

(*a*) The first period (A), the most important (the so-called "period of adaptation," or "dangerous"), is that in which the flow is slowest. At the end of the first minute hardly half a cubic centimetre of blood has passed; at the end of the second minute one or two cubic centimetres more have been transfused, to be followed by four more cubic centimetres of blood in the course of the third minute. The flowing then remains sensibly at the same slow rate for this first period, during which not quite a quarter of the total injected quantity flows in. The time is relatively long, as the length of it represents nearly a half of the whole length of time of the complete operation.

(*b*) The second period (B), so-called "constant rate," corresponds to the period during which the rate of flow is quicker than in the preceding period, and allows in a shorter time the passage of an amount of blood equal to or greater than that transfused in the first period. Towards the end of this second period the speed slackens so as to become equal to and sometimes less than the initial speed. This bend of the curve shows accurately the beginning of the third period (*a*).

(*c*) The third period (C), so-called "acceleration period," is that during which, in a shorter time still than in the second period, the rate of flow is quickened sharply and ends in full speed without any danger.

5. The heavier the animal, the greater is the increase in the rapidity of the flow, although there is no arithmetical progression, but the rapidity of the flow always presents the form of the curve described.

6. The rapidity of the flow also depends on the nature of the transfused liquid without the curve itself being modified. The greater the viscosity and density of the transfused liquids the slower the rapidity of the flow. If we take, for instance, a dog weighing 15 kilos the average of the flow can be 25 c.cm. a minute if physiological serum is used. If this serum is diluted one-half with horse's blood the rapidity of the flow will be from 12 to 15 c.cm. a minute; from 9 to 10 c.cm. if the horse's blood is pure or if milk is injected. It will be less than 9 c.cm. if a mixture of gum arabic is injected in quantities of 90 grams for one litre of physiological serum; lastly, the rate will be half a cubic centimetre a minute when paraffin oil is used. These figures have not an absolute value, for they are governed chiefly by the curve already mentioned. The following curve, established for an infusion of gum arabic containing 90 grams in 1,000 c.cm. of physiological serum, is particularly typical.

7. Practically, it is enough to place the liquid to be transfused in a receiver on a level hardly higher than the heart of the patient who is to receive it. The essential condition of a good transfusion is that the heart of the receiver shall rule the flow, as is the case usually in the intravenous injections of physiological serum.

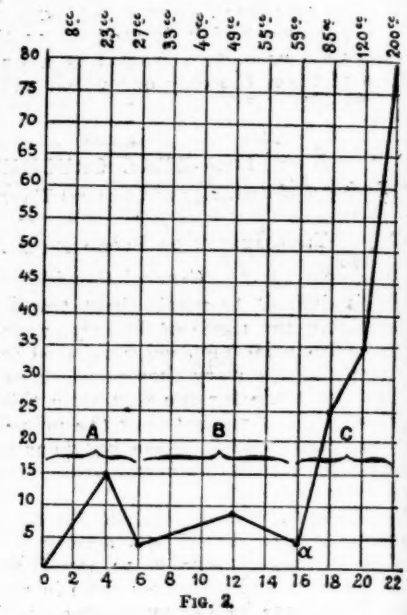

FIG. 2.

Other Factors in Transfusion Accidents.

Under the above conditions no accidents occur after transfusion, and the phenomena of agglutination, embolism, and haemolysis, so often incriminated in those accidents, do not seem to play an obvious part.

(*a*) *Agglutination.*[2]

Contrary to the classical view, mixtures of heterologous bloods do not necessarily produce agglutination. Thus, mixture of the blood of a guinea-pig or the blood of a horse with human blood can be performed very well without causing agglutination. On the other hand, it is well to know that agglutination can occur, even strongly, without causing the smallest accident. The numerous transfusions of horse's blood we have given to the dog have always been without any danger, in spite of a positive agglutination, assuming, of course, that respect is paid to the laws of the rate of the flow already mentioned.

It is surprising, nevertheless, to think of the importance attached to this question of agglutination by modern advances in knowledge concerning incompatible bloods and blood groups, when we consider the numerous injections of different substances and serums introduced into the veins which lead, after all, to agglutination. We have shown, with Ragot, that arsenic ionoïde, collargol, colloidal gold, and collothiol agglutinate human blood. The same occurs with iodine ionoïde and of copper ionoïde. The antipneumococcic, antidysenteric, antitetanic, antistreptococcal, antidiphtherial, and antimeningococcal serums also have all shown a marked power of agglutination. Nevertheless, in certain circumstances we do not hesitate to introduce into the veins these chemical substances and serums.

These different reasons show how exaggerated is the danger attributed to agglutination. Going further still in this demonstration, we have injected into both the right and left ventricle of a guinea-pig mixtures of horse's and human blood (Ragot), of horse's and dog's blood, which, though causing strong agglutination, did not result in any accident.

(*b*) *Embolism.*

We can well admit that the agglutination is an embolism in miniature; then embolisms are not necessarily a cause of accidents. We have been able to obtain a more significant demonstration by introducing into the circulatory torrent some cellular debris, and even solid but friable particles of stone mixed with a physiological serum. Our cellular debris was obtained by haemolysing horse's blood as completely as possible with distilled and sterilized water. By filtering this there is obtained a very coarse and granulated residue, composed of destroyed red cells of cellular debris; the residue is carefully and repeatedly washed in physiological serum and transfused into the dog after dilution with an equal volume of physiological serum.[3]

for five to six days and has occurred at least twice since, the last time about October, 1925. On admission there was a secondary anaemia, the haemoglobin giving a Sahli index of 43°=51 per cent.

CASE II.—A man, aged 48; admitted May 5th, 1926. His height was 6 ft.; weight 12 st. 2½ lb. In October, 1925, and March, 1926, he vomited blood. Investigation led to a diagnosis of duodenal ulcer. There was severe secondary anaemia; haemoglobin 25° Sahli=30 per cent.

These patients were comparable as regards their anaemia and its cause. They were both big men and both were treated in the same hospital at the same time, and with the same objects—namely, to aid the ulcer to heal, or, failing that, to get the blood into a suitable state for operation. Treatment consisted of rest, light diet, and iron. The first patient also had arsenic.

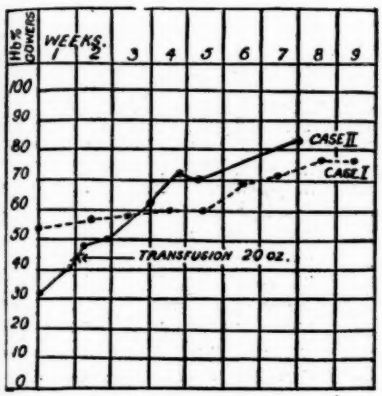

FIG. 2.—Cases I and II.

The only essential difference in the treatment in the two cases was that the older man (Case II) received a transfusion of 20 oz. of blood. The blood was of special value as it was taken from a patient with polycythaemia, fortunately a universal donor. The count of this blood at that time was 9,200,000 red cells with 128 per cent. haemoglobin.

The course of the recovery from anaemia in the two men is shown in Fig. 2, in which the percentages of haemoglobin during treatment are plotted out. The figures for the red corpuscles, which are not shown on the chart, showed similar increases.

The haemoglobin of the younger man, who was not transfused, rose in seven weeks from about 52 to 72 per cent.—that is, 30 degrees. That of the older man in the same time rose from 31 to 83 per cent.—that is, over 50 degrees. Of these it rose about 30 degrees in the three weeks following the transfusion.

2. The value of transfusion as a prophylactic against post-operative shock in those who are bad surgical risks is very great. Two cases may be cited.

CASE III.—A lady, aged 54, had had a gastro-enterostomy for gastric ulcer performed five years before admission. Ever since she had suffered pain and swelling to a degree which prevented her from taking enough food. She had been a complete invalid all the time and her weight had sunk to 6 st. 1 lb. Examination showed that the stoma let bile in but could not let food out. There was also evidence of distortion of bowel from adhesions.

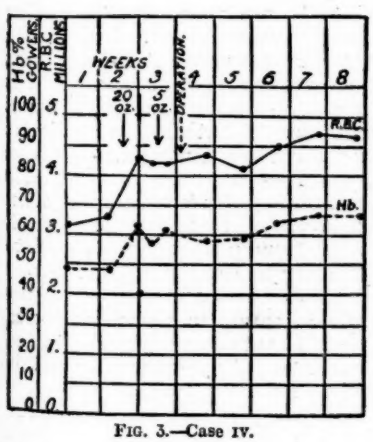

FIG. 3.—Case IV.

For two months every effort was made, by complete rest, diet, medicine, etc., to improve the nutrition and lessen the discomforts of the patient, but without adequate result. At the end of that time her weight was 6 st. 2¾ lb. She was unable to walk and was in no state for such an operation as is required in these cases, where adhesions have to be patiently dissected and anastomoses unmade or made, or both. A transfusion of 9 oz. was therefore given. The patient felt much better for it. An ischiorectal abscess developed soon after. When this was well the patient later was able to bear a long operation, with much subsequent benefit.

In this case the transfusion was not given for anaemia, as the patient's blood standard was not far below that of a normal woman, but in order to increase her general strength and resistance.

CASE IV.—A woman, aged 65, was found to be the subject of a cancer of the pyloric part of the stomach. The symptoms were of a year's duration. In that time laparotomy, suggested earlier, had been refused, a course of treatment with E.R.A. having been taken instead. It was desired to open the abdomen to see (1) whether gastrectomy was practicable or, if not, (2) to relieve obstructive vomiting. As a preparation two transfusions were given, one of a pint of the erythraemic blood used in Case II, and another, a week later, of 5 oz. of ordinary blood. A rigor occurred after the second transfusion. At operation the growth was found to extend from the oesophagus to the pylorus and was adherent to the liver. A short circuit was done.

Fig. 3 shows the effects on the blood. Note the rapid effect of the first large transfusion. So far from the operation depressing the state of the blood, it will be seen that the haemoglobin continued to rise after it.

The way in which this weak and elderly lady bore the operation was remarkable. It was said at the time that she showed no more shock than a healthy young soldier after a simple laparotomy. The patient's symptoms were relieved. She died five months later, with jaundice, without suffering, and did not know the true nature of her illness.

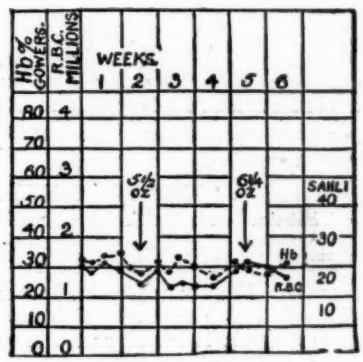

FIG. 4.—Case V.

3. In pernicious anaemia transfusion offers the most valuable means we have of improving the state of the blood in cases in which there is still a downward tendency after treatment by removal of septic foci, rest, good food, hydrochloric acid, and arsenic. It is suggested that small quantities of blood may be as useful as large. A conclusion on such a point must be formed on the results from a great number of cases. The greatest improvements we have seen have been from large transfusions of erythraemic blood; and the benefit to the patients' blood did not fall away in a few days. This suggests that it is advantageous to put in as much haemoglobin and as many red corpuscles as practicable—subject, of course, to adequate preliminary tests being made.

Here is a case in which no immediate benefit was received from two small transfusions from the patient's own sons.

CASE V.—A woman, aged 65. Two years' history. The first transfusion was followed by a mild rigor and herpes labialis. The appetite improved and fatigue was less, but the blood remained as before. Some weeks later improvement in the general state was reported.

In the following case great benefit was received from three successive transfusions.

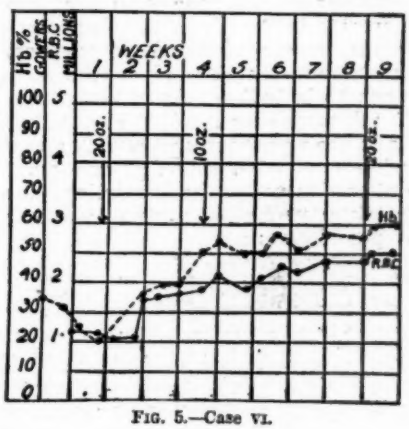

FIG. 5.—Case VI.

CASE VI.—A man, aged 54, had been regarded as neurasthenic for some years. He had felt weak for a year and had lost weight, but four months earlier his blood counts had been normal. The nature of his illness, which was acute, was not evident until admission. He had septic teeth, glossitis, and achylia. Arsenic was administered under the skin, with total rest and suitable diet, but the patient's downward course continued, the haemoglobin falling to 20 per cent., and the red corpuscles to 1,000,000. His clinical state was serious. A pint of blood from a patient with polycythaemia was then given. The veins, like the tissues generally, were small and shrunken, and it was not found possible to puncture one through the skin. An incision was therefore made and a cannula tied in. After the transfusion the patient began to improve at once. A fortnight later 10 oz. of blood from an ordinary donor was given. At this, as well as at a later transfusion, a vein could be pierced, owing to the better state of the circulation; and the usual closed method was used.

accelerated, and even of the Cheyne Stokes type. Then come cries, shivers with tremors of the four limbs, trembling of the hind part, and contractures of the whole body; there are also nausea and vomiting. When the animal is unfastened it remains lying on its side, reacting no more to stimuli. Involuntary micturition and defaecation occur, and breathing ceases. The heart stops, the corneal reflex disappears, and the cornea looks glassy, the pupil of the eye dilates, and death ensues.

These accidents are sometimes only partial if the transfusion is slower. Nevertheless, when the conditions of the flow are not followed exactly as we have indicated them, the animal does not recover completely; it will be less bright, will not play, is somnolent and not hungry, at times passes blood in the urine and faeces; it is found dead twenty-four to forty-eight hours after the transfusion.

How are we to explain these accidents? Even when they are immediate, we do not think that this implies a real shock. We can, indeed, reproduce them at will, precipitate or slacken them according to the rate of flow towards the right side of the heart. Investigation shows that, in all these cases, the right side of the heart is dilated considerably, whether death be rapid or delayed for a few days.

Two forms are to be considered: the acute dilatation and the delayed dilatation.

(*a*) The very acute or primitive dilatation, which can be easily provoked with pure physiological serum if too quickly injected, is caused by a relatively considerable liquid mass pouring rapidly into the right cavities of the heart; it presses on the sides of the auricle and soon penetrates in the ventricle.

(*b*) The delayed or secondary dilatation appears when the accidents are postponed from two to eight hours, or even a little more. In that case considerable pulmonary lesions and infarcts are found. Sometimes a big clot of organized blood starts from the orifice of the pulmonary artery and reaches to its bifurcation. Then it may be believed that the dilatation of the right side of the heart is partly consequent on obstruction of the arteries of the lung. The too great speed of the transfusion has not allowed the too dense or too viscous liquid (blood, oil, milk, gum arabic) to pass in small portions through the capillaries of the lungs; consequently there is a hindrance more or less considerable, and a fatigue of the right part of the heart—an indication of a fatal sequel.

Thus we come back to a mechanism similar to that of the so-called pulmonary embolisms, those which happened formerly by the coagulation of the blood in the course of the transfusions in which sodium citrate was not used.

The pulmonary embolisms themselves are not necessarily harmful if they are made prudently and slowly. But as soon as the rate of the flowing is quickened, they might provoke, following the flow, an immediate or late death. So it was in our experiments with friable stone, particles of which, though larger than the red cells, had been perfectly tolerated by the organism so long as they were slowly transfused. Rapidly injected, they killed our dogs without exception.

The same remarks apply to the haemolysis which often happens during the transfusion. Haemolysis is insignificant and passes unperceived if the transfusion is made slowly. If it is done roughly it might provoke a certain disturbance of the kidneys, with pains in the loins and haematuria.

Conclusions.

The experimental and clinical researches which we have made during the past five years show that the transfusion of heterologous citrated blood is harmless in the following conditions:

1. It is necessary to make the transfusion very slowly, following the rules we have established.

2. The donor animal must be absolutely healthy and not have performed any great muscular work during the one or two hours previously.

3. The blood must be used immediately after its passing from the vein of the yielding animal.

4. As to the transfusion of blood from animal to man, we give the preference to horse's blood, which seems to be tolerated better than the blood of sheep or ox.

5. We do not advise the transfusion of pure horse's blood; it is better that it be diluted a third or half with physiological serum.

6. A good plan is to add adrenaline to the mixture to be transfused up to a strength of 1 in 1,000: five drops for 250 c.cm., or less.

7. Transfusion of horse's blood into man might be practised in the same way as intravenous injections of physiological serum.

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[2] R. Cruchet et Caussimon. Loc cit., April, 1925, p. 343.
[3] R. Cruchet et Caussimon: Loc cit., January, 1926, p. 74.

IV.—E. I. SPRIGGS, M.D., F.R.C.P.,

Ruthin Castle.

DR. E. I. SPRIGGS spoke of the practical aspects of transfusion (1) after haemorrhage from the bowel; (2) as prophylactic against post-operative shock in malignant disease; and (3) in pernicious anaemia; and quoted illustrative cases, with charts showing the effect upon the percentage of haemoglobin and the number of red corpuscles. He continued:

As varying directions are given, I venture to mention in detail the actual method used. With rare exceptions no incision should be made, the blood being drawn from and put into a vein through a needle. After making sure that donor and patient are of the same group the two bloods are tested directly against each other. The veins of the donor's arm are made prominent by putting the air-bag of the sphygmomanometer on to the upper arm and raising the pressure to 60 to 100 mm. of mercury, the fist being closed. A bandage or tourniquet is less efficient and is apt to obstruct the artery. The needle of a 10 to 20 c.cm. Record syringe is then thrust into the median basilic vein of the donor, attached by pressure tubing to a Potain aspirator, and, after letting down the pressure in the air-bag, the blood is drawn into a 4 per cent. citrate solution, of which 100 c.cm. are used to each 500 c.cm. of blood. The vein of the recipient is similarly punctured by a needle and a little blood allowed to flow back through the needle so as to fill it. The blood is then passed in from a flask-shaped bottle, which is kept warm with hot cloths, making sure that the tube from the flask and its connexion are full of citrated blood before fitting it on to the overflowing needle in the recipient's vein. The pump of a sphygmomanometer is used to force the blood in gently if it flows too slowly. To transfuse a pint of blood takes as a rule about three-quarters of an hour to an hour. Should the blood clot in the tube or needle—a rare occurrence—the needle is taken out and washed through with citrate solution. Sharp needles are essential, and spare ones should be available.

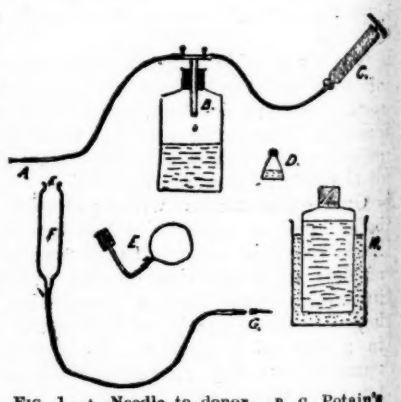

FIG. 1.—A, Needle to donor. B, C, Potain's aspirator. D, Bottle containing 4 per cent. sodium citrate, 100 c.cm. to 500 c.cm. blood. E, Pump off sphygmomanometer. F, Container. G, Needle to patient. H, Blood kept warm in jug of water.

Fig. 1 shows the details of the apparatus used at Ruthin Castle.

1. After haemorrhage of the bowel the tedious recovery from the resulting anaemia may be hastened by a transfusion. The following two cases may be compared in this respect.

CASE I.—A man, aged 30; admitted May 14th, 1926. His height was 5 ft. 11½ in.; weight 12 st. 4¾ lb. Gastro-enterostomy had been performed in 1922 for duodenal ulcer. He suffered in the following year from symptoms suggesting jejunal ulcer. In the spring of 1924 he had a severe haemorrhage. Melaena persisted

patients die fairly often from this cause. Furthermore, the necropsies showed that, without either transfusion or surgical intervention, death from haemorrhage was inevitable. I may illustrate this point by a drawing made from a specimen recently removed at necropsy (Fig. 1). In the centre of the floor of a large chronic ulcer is an eroded blood vessel which has bled and become occluded. At the edge is a second larger vessel standing up in the ulcer with a big recent erosion in its wall. It would have been almost a miracle if this second hole had become spontaneously and permanently closed by a blood clot. The patient from whom this specimen was taken had been transfused after the haemorrhage from the first vessel, but was not operated upon; he had died from recurrent haemorrhage from the second vessel.

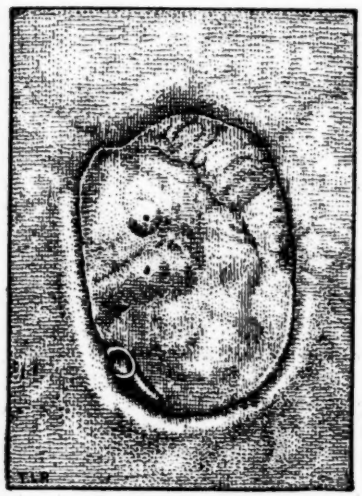

FIG. 1.—Drawing of a chronic gastric ulcer, showing healing of one erosion in a blood vessel (represented by the two black dots), with subsequent erosion in another place. The patient was transfused after the first haemorrhage and survived; he died from the second haemorrhage.

As regards the second statement, I believe that it is a fallacy to consider transfusion a potential cause of recurrence of haemorrhage. When a patient has had a severe haemorrhage he suffers chiefly from a depleted blood volume, and the heart is called upon to maintain the blood pressure necessary for life without an adequate volume of fluid in the circulation. The strain falls mainly, therefore, upon the heart, and the first effect of the transfusion is to relieve the heart of this excessive burden. The rise of blood pressure which follows transfusion is consequently neither so great nor so sudden as to be likely to dislodge a clot plugging the eroded vessel. There is also the very important effect of the transfused blood in promoting the coagulation process and, thereby, reinforcing the clot already formed. This is due partly to the properties of the new blood that is introduced, and partly, if citrated blood is used, to the paradoxical action of sodium citrate in actually increasing the coagulability of the blood when introduced into the circulation. The accompanying drawing (Fig. 2) will illustrate what happens if this clot formation is successful. The specimen was taken from a patient who had died from another cause. The vessel is in the floor of a chronic ulcer, and is quite unable to retract. The clot extends for a considerable distance along the lumen and is organizing, so that digestion or further loosening is very unlikely.

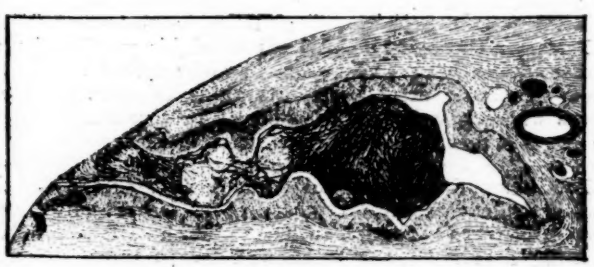

FIG. 2.—Drawing of a longitudinal section (× 8) through an eroded blood vessel in the floor of a chronic gastric ulcer, showing the extent of the thrombus which has formed in the mouth of the vessel.

Conditions in the individual patients are so various that more detailed statistical analyses of the reports of the London Blood Transfusion Service or from our own hospital records will not be of much value. The rapid extension of the use of transfusion in these cases is the best proof of its efficacy. It cannot, I think, be denied that there is a certain proportion of patients who must inevitably die without the aid of surgery. It is, moreover, certain that operations on them cannot be undertaken without the aid of transfusion. The actual results of surgery have not in the past always been good because our medical colleagues have tended to offer us for operation those patients whose condition was already desperate. Even among those, as the reports of the Blood Transfusion Service in several instances ("patient moribund") show, lives have been saved by transfusion, and in the cases that have come under my own observation the results are improving with experience. I may illustrate this by an account of three patients recently treated in the wards of the Surgical Unit at St. Bartholomew's Hospital.

CASE I.

A dock labourer, aged 57, had had symptoms of gastric ulcer for six years, but had never vomited blood until May, 1921, when he was actually in a medical ward at St. Bartholomew's Hospital with Professor Fraser undergoing treatment with Lenhartz diet. He afterwards improved, but had a recurrence of haematemesis in August, 1923. He was readmitted to a medical ward at St. Bartholomew's Hospital and had a severe haematemesis on three consecutive days. He was then extremely anaemic, and appeared to be almost moribund when he was transferred to the Surgical Unit. A blood transfusion of 900 c.cm. was given at 5 p.m. on August 26th, and four hours later an operation was done by Mr. T. P. Dunhill. The stomach was opened and a bleeding point in the floor of an ulcer near the pylorus was cauterized. A posterior gastro-enterostomy was performed. The patient made an uninterrupted recovery, and there can be no doubt that his life was saved by the transfusion and operation.

CASE II.

A woman, aged 29, had had symptoms of gastric ulcer for over two years. In 1921 she had haematemesis while in hospital, and this recurred in 1923, while she was being given Lenhartz diet. She was then transfused with 500 c.cm. of blood, but this did not arrest the bleeding, and haematemesis recurred on several successive days. She was transferred by Professor Fraser to the Surgical Unit on July 9th, 1923, when she was blanched, sweating, and restless. Her red blood cells had fallen to 2,000,000 per c.mm. and the haemoglobin to 35 per cent. An exploratory laparotomy was done on the same day by Professor Gask. The stomach was examined, but no lesion could be discovered from the outside. It was therefore opened through its anterior surface. A small ulcer with an eroded vessel in its base was then seen on the posterior wall. The mucous membrane was sewn over the ulcer, and the stomach and abdomen were closed as quickly as possible. A blood transfusion was begun about fifteen minutes after the operation had started and was continued through the critical stages, 850 c.cm. being given. The patient was in a very low state, the blood pressure being below 100 mm. at the beginning of the operation, and having fallen to 80 mm. when the transfusion was begun; it gradually rose from this point, and was 120 mm. at the conclusion of the operation (Fig. 3). The patient made an uninterrupted recovery. Two days after the operation the red blood cells had risen to nearly 4,000,000 per c.mm. and the haemoglobin to 65 per cent., and the improvement continued afterwards.

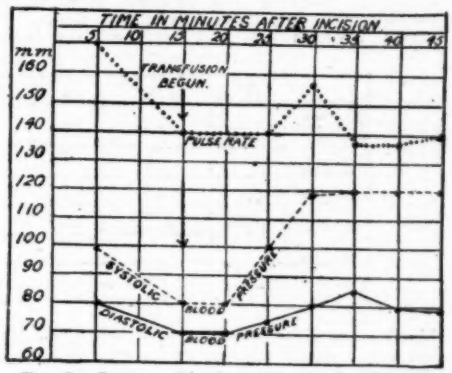

FIG. 3.—Case II. Blood pressure and pulse rate curves taken during operation and transfusion for acute gastric haemorrhage.

CASE III.

A man, aged 39, had had symptoms of pyloric ulcer for ten years. On May 23rd, 1926, he had severe haematemesis and melaena. He was transfused with 600 c.cm. immediately after admission to St. Bartholomew's Hospital under Dr. Morley Fletcher, his condition being extremely serious. On the following day he had improved; his red cells numbered 2,400,000 per c.mm. and his haemoglobin was 50 per cent. He was not, however, seen by a surgeon as the physicians regarded him as being too ill for any operation. He remained in the medical ward for the next month. He had no further haematemesis, but the bleeding continued in a lesser degree, as shown by occult blood in the stools and by an occasional melaenic stool. On June 28th his condition was still very bad. His red blood cells and haemoglobin remained at almost exactly the same level as on the day after admission. He was then transferred to the wards of the Surgical Unit. On July 2nd Professor Gask performed a laparotomy and found an indurated mass at the pylorus with general oedema of the stomach wall. A posterior gastro-jejunostomy was done. During the operation the patient was given a massive transfusion from two

Fig. 5 shows the initial downward course of the blood in this patient and the great improvement after the first transfusion. When the patient became strong enough the offending teeth were removed, and as soon as the haemoglobin reached 40 per cent. he began to get up. He left taking regular walks. The haemoglobin was 60 per cent., red cells 2,500,000.

The procuring of donors is a real difficulty, especially as a proportion of those who offer are not entirely healthy or do not belong to the right groups. In a hospital there are often some patients who need venesection for severe hyperpiesis, or, more rarely, polycythaemia, and in a few of these the blood may be suitable to use for others. A general organization of healthy donors in each district is needed.

V.—GEOFFREY KEYNES, F.R.C.S.,

First Assistant, Surgical Professorial Unit, St. Bartholomew's Hospital.

BLOOD TRANSFUSION IN SURGERY.

THE contribution which I have been asked to make to this discussion is to deal with the surgical aspect of the question. It is difficult to set any precise limits to the surgical applications of transfusion, but I can at any rate avoid reference to the primary anaemias and to other diseases belonging as obviously as these to the province of the physician.

The recognition in this country of the value of transfusion in surgery has been of comparatively slow growth; it is, however, now very well established, and promises to become an operation performed almost daily in any large hospital. There was formerly some difficulty in obtaining an adequate supply of blood donors, and in a communication on this subject made to the Surgical Section of the Association in 1924, I suggested that these might best be supplied through the Red Cross organizations. A supply of voluntary donors to some of the London hospitals had, as a matter of fact, already been started by the individual enterprise of Mr. P. L. Oliver in 1922, and his organization has recently been recognized and taken over by the British Red Cross Society. This branch of the society's activities is known as the Blood Transfusion Service, and is now playing a large part in the development of blood transfusion as an adjunct to surgery in London. I have been permitted to use the reports received by this service during the last four years (June, 1922, to May, 1926) from all the London hospitals, and I think that information based on the comparatively large number of transfusions thus made available for analysis will carry more conviction than if based only on my own experience. Any favourable or unfavourable conclusion that may be reached will at any rate be free from the charge of personal bias.

The supply of blood donors has kept pace with the increase in the demands of the hospitals, which advanced from 13 in 1922 to 428 in 1925. The total number of calls for donors so far received by the Blood Transfusion Service is in the neighbourhood of 700, and nearly a third of these were received in the first five months of 1926. It is of interest to notice the proportions in which the transfusions actually performed were distributed between the various types of case:

No report received	144	
Medical diseases	158	
Surgical diseases	250	319
Gynaecological	69	

The gynaecological patients were divided between acute secondary anaemia, sepsis, and surgical operations, and may therefore be reckoned in the surgical score. If those cases in which no report was received be divided between medical and surgical in the same proportion as those which were reported, we arrive at the final figures of—

Medical	206
Surgical	411

or almost exactly two surgical for every one medical case treated by transfusion. This is some indication of the present relative value of transfusion in surgery.

I will now give a further analysis of the surgical cases in order to discover for what types of patient transfusion is chiefly used, and what the results have been. It at once becomes clear that by far the largest group—no fewer than 121 out of a total of 221 in general surgery—falls into the category of "gastric or duodenal." The types and results are as follows:

Gastric and Duodenal Type (121 cases).—Ulcer, acute or chronic; or carcinoma of stomach, with or without haematemesis or melaena, or both, or preceding or following operation.

No benefit	18
Temporary improvement, but died later	13
Result good or very good	90

General Surgical Type (100 cases).—Including amputation of leg, splenectomy, carcinoma of colon, carcinoma of bladder, thoracic tumours, nephrectomy, street accidents, secondary anaemia from various causes, etc.

No benefit	4
Temporary improvement	6
Result good or very good	90

Haemophilia (4 cases).

No benefit	1
Result good	3

Septicaemia and Pyaemia (25 cases).

No benefit	22
Result good	3

Gynaecological Type (69 cases).

No benefit	7
Temporary improvement	4
Result good or very good	58

It is at once evident that the results in general are excellent, except in the group "Septicaemia and pyaemia," where very little benefit has followed transfusion. My personal experience on a smaller scale fully agrees with the results set out above. It is, of course, impossible to say of any given patient that he would have died had he not been transfused, but it is equally impossible to avoid the conclusion that transfusion has given a substantially increased margin of safety where so large a measure of satisfaction has been so widely expressed.

The value of transfusion in such surgical conditions as haemophilic haemorrhage, traumatic haemorrhage, and, indeed, most forms of acute secondary anaemia, is now fully recognized, and I need not emphasize this point. There is, however, one group of patients—namely, the "gastric and duodenal" group already referred to—in which the value of transfusion has been somewhat slow to receive its proper recognition, although my own experience seemed to show that it was very great. It was with special interest, therefore, that I discovered from the reports of the London Blood Transfusion Service how large a number of these patients are now receiving transfusion. I feel, as a surgeon, that it is here that blood transfusion is enabling a stride forward to be made, for lives are being saved which otherwise would have been lost. Transfusion in these cases may serve a dual purpose: it may prevent the death of the patient from actual loss of blood, and it may make possible a necessary operation which, without transfusion, would be impossible. It is therefore applicable to cases of bleeding from acute ulcers, in which operation is seldom necessary; to cases of bleeding from chronic ulcers, innocent or malignant, in which operation is often necessary; and to operations in general upon the stomach and duodenum, which tend to be very severe, and therefore to be attended by much "operative shock." Transfusion may, of course, be used with great advantage to give the patient an increased margin of safety in all operations of particular severity, but I shall confine my remarks to the gastro-duodenal group, and illustrations taken from this group will cover all the points I wish to make.

Transfusion used to be withheld in cases of gastric or duodenal haemorrhage for two main reasons: (1) It was stated by some authorities that patients never die from haemorrhage from a gastric or duodenal ulcer, and it was therefore said to be unnecessary either to transfuse or to operate. (2) It was believed that there was an actual danger in transfusion, and that the ensuing rise of blood pressure would result in further haemorrhage.

The first statement I believe to be untrue, the second to be based upon a fallacy. Working in a big general hospital, I have seen a large enough number of *post-mortem* examinations of patients who had died from sheer haemorrhage from a gastric or duodenal ulcer, to be convinced that

OBSERVATIONS ON TWENTY-FIVE CASES OF PROSTATECTOMY.

BY

RALPH COYTE, M.B., B.S.LOND., F.R.C.S.,

ASSISTANT SURGEON TO ALL SAINTS' HOSPITAL AND THE QUEEN'S HOSPITAL FOR CHILDREN; SURGICAL REGISTRAR, PRINCE OF WALES'S HOSPITAL, TOTTENHAM.

DURING 1925 I had under my care in All Saints' Hospital 25 cases of enlarged prostate for which prostatectomy was performed. These cases I have subsequently followed up in the out-patient department for the ensuing two months or longer.

The average age of the patients was 60—the youngest being 49 and the eldest 73. The mortality was one; this patient died on the sixteenth day after operation from a pulmonary embolus. He exhibited the usual symptoms; he was taken with a sudden desire to defaecate, and while on the bed-pan fell back dead.

Of the 25 operations, 20 were by the one-stage and 5 by the two-stage method. In the selection of method I have been guided by three factors:

(*a*) *The Clinical Picture.*—Patients exhibiting a dry furred tongue, persistent headaches, loss of appetite (particularly for meat), and the passage of scanty urine are only suitable for a two-stage operation.

(*b*) *Cystoscopy.*—This I have done as a routine, and is, in my opinion, of the greatest value, in that it demonstrates the degree of sepsis within the bladder. A gross degree is only suitable for a two-stage operation. While the cystoscope is in position the kidney function can also be tested by intravenous injection of indigo-carmine.

(*c*) *Urea Concentration Test.*—Where the final concentration falls below the 1.3 mark I think the two-stage operation should be adopted.

As regards the actual operation, the first 8 cases of this series were treated by putting a large drainage tube (bore 1 in.) in the bladder, without packing the prostatic cavity. In two of these cases fairly severe haemorrhage occurred two hours after operation. In the remaining 17 cases I have packed the prostatic cavity for forty-eight hours. I find there is often a little bleeding on removing the packing, but it is never serious; and although the procedure causes a certain amount of pain this can easily be controlled by morphine. I always pack the cavity with two fingers in the bladder, and without widely retracting the edges of the bladder wall, as I consider that the latter procedure somewhat increases the shock of the operation.

The tube is removed on the sixth day, and the patient then washed per urethram with a solution of 1 in 10,000 silver nitrate once a day. The average time taken for the suprapubic wound to heal has been twenty-four days—the quickest being sixteen, and the longest thirty-five days. The patients taking the longest time to heal have all been markedly obese.

Complications met with have been epididymitis in 7 cases; these all subsequently cleared up. There was one case in which the suprapubic wound reopened five weeks after discharge from hospital; this man had at the time of operation a stricture in the penile urethra which had previously been dilated; after operation he did not come up for treatment as advised, but on dilatation of his stricture the fistula rapidly closed. In one case the symptoms were not relieved by the operation, and by posterior urethroscopy I discovered that this man had developed an obstruction in the shape of a prostatic ledge. This I dealt with by diathermy through the urethroscope, and the patient is now in good health. The remaining patients made uneventful recoveries, and have since been quite well.

Sections of the prostates were made after removal. In one case an early adenocarcinoma was found to have commenced; this man is still quite well nine months after operation. Some of the glands after removal showed small areas of normal prostatic tissue around the adenomatous portion, and the fatal case showed normal prostatic tissue remaining around the cavity. These latter findings show that it is impossible to remove the prostate completely, and that the operator must leave sufficient normal tissue for a further potential adenomatous enlargement.

THE INHIBITION OF INSULIN ACTION BY TOXAEMIAS AND ITS EXPLANATION.

A Preliminary Communication.

BY

R. D. LAWRENCE, M.D.,*

CHEMICAL PATHOLOGIST, KING'S COLLEGE HOSPITAL.

THE effect of toxaemias and different forms of sepsis in reducing insulin action in diabetes is one of its chief puzzles and the greatest weakness of insulin therapy. All workers are agreed that sepsis and infections make diabetes worse, are a common immediate cause of coma, and that their onset requires a greatly increased dosage of insulin to produce the same effect. The problem of this inhibition of insulin action is therefore of great physiological and therapeutic importance. It was thought that the cause that prevented the usual action of insulin in septic conditions would most likely be the production of a metabolic condition that failed to respond to insulin in the usual way, and the failure would not be due to direct chemical inhibition of insulin by the circulating toxins.

The easiest way to attack the problem seemed to be to try to produce an insulin-resistant condition in normal animals by toxins and to observe any accompanying changes which might account for the failure of insulin action. Various toxins have been tried on rabbits, and the clearest results have so far been obtained by diphtheria toxin. With this a condition has been produced in which the power of insulin to reduce blood sugar has been greatly diminished and sometimes abolished altogether. At the same time extensive pathological changes have been observed in the thyroid and adrenal glands which would appear to be the cause underlying the inhibition of insulin action. The details of these experiments and a number of curious observed facts in connexion with insulin action will be published soon in the *British Journal of Experimental Pathology*, but it is considered desirable now to give a summary of the work, as it is of clinical as well as experimental interest.

Rabbit Experiments.

It has been found that when normal rabbits are given a dose of diphtheria toxin which kills them in about four to eight days, a dose of insulin which previously caused a considerable drop of blood sugar fails to do so. This usually does not take place on the first day, when the animal is at the height of its pyrexial reaction, but becomes most noticeable when the action of the toxin is fully established. On certain days, indeed, insulin has been observed to raise, and not to lower, the blood sugar concentration. These points have been repeatedly observed after the injection of diphtheria toxin.

Histologically, striking changes have been observed in the thyroid and adrenal glands of these animals, and to a greater degree than in the other organs examined. The thyroids showed great congestion, disappearance of the colloid, and destruction and confluence of many of the alveoli. In the adrenals congestion and signs of complete exhaustion and disappearance of the lipoid were observed. Such changes in the adrenal are a well known result of death from diphtheria toxin, and are, indeed, used to distinguish true diphtheria from diphtheroid organisms.

The Significance of these Experiments.

The thyroid and adrenal glands and their extracts are known to be direct physiological antagonists to insulin. This has been shown quite clearly in animals and in man by the simultaneous injection of adrenaline, which is found to prevent the usual action of insulin in lowering blood sugar. It has also been shown that thyroid feeding in animals greatly reduces the usual action of insulin. And, from the clinical point of view, the disturbance of carbohydrate metabolism and resulting glycosuria in hyperthyroidism and the hyperadrenalism of excitement is well known. It would appear clear, therefore, that an agent which stimulates the thyroid or adrenal, singly or together, would antagonize the usual action of insulin.

* Working on insulin for the Medical Research Council.

donors. First 700 c.cm. were injected rapidly during the initial stages of the operation. This was followed by a second 700 c.cm., given more slowly during the critical stages of the operation. The result is shown by the systolic blood pressure curve, which began at 120 mm. and finished at 140 mm. (Fig. 4); it never fell below 110 mm., this point being reached between the end of the first transfusion and the beginning of the second. The patient made a good recovery. On the evening of the same day his red blood cells had risen to over 4,000,000 per c.mm., and three days later his haemoglobin was still at 63 per cent. (Fig. 5).

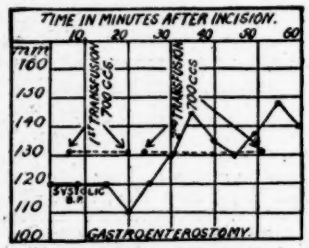

FIG. 4.—Case III. Blood pressure curve taken during operation with massive blood transfusion for chronic gastric haemorrhage.

The value of transfusion as an adjunct to operation when there is no severe anaemia may also be illustrated by a case from the gastro-duodenal group.

CASE IV.

A woman, aged 25, had a perforated gastric ulcer in 1919, at the age of 19, after three months' "indigestion." She made a good recovery, but symptoms recurred at intervals. A gastric ulcer was shown to be present high up on the lesser curvature, and eventually an operation for partial gastrectomy was undertaken by Professor Gask on June 8th, 1926. The patient was a thin, debilitated girl, and arrangements were made to transfuse her during the operation. The stomach was found to be involved in extensive adhesions and a partial gastrectomy was done, the operation reaching the extreme limit of what was technically possible and lasting for over two hours. The transfusion was begun towards the end of the first hour and 800 c.cm. of

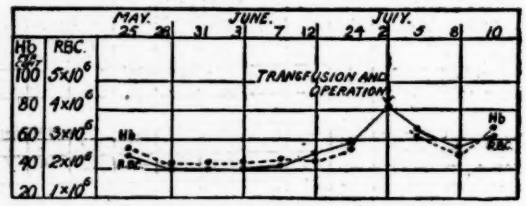

FIG. 5.—Case III. Red blood cell and haemoglobin curves showing the effect of operation with transfusion.

blood were given during the next eighty minutes at the rate of 100 c.cm. every ten minutes. The blood pressure fell gradually during the operation, but the systolic pressure never fell as low as 100 mm. and had risen to 120 mm. at the end (Fig. 6). The transfusion was believed to have played a considerable part in maintaining the patient's good condition during so long and severe an operation.

I cannot now add much under the heading of technique, but it is important to establish, if possible, the optimum time for the transfusion. Experience shows that if transfusion is given purely with a view to replacing blood lost

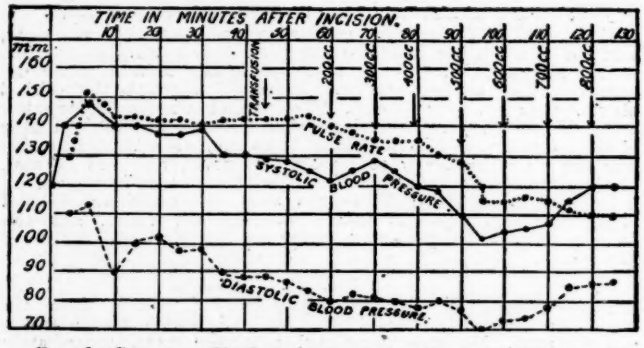

FIG. 6.—Case IV. Blood pressure and pulse rate (dotted line) curves taken during operation with blood transfusion for a difficult gastrectomy, the transfusion being spread over eighty minutes as indicated by the arrows.

and discouraging further haemorrhage, as in acute ulcer, it should be done without delay. If the patient be seriously ill with haemorrhage from a chronic ulcer which is to be dealt with by operation, I believe the ideal procedure is to give two transfusions, one a few hours before operation and the second while the operation is actually proceeding. As Professor Gask has remarked to me, an operation conducted in this way, with the blood being injected into one arm and the blood pressure being recorded in the other, is like a physiological experiment. The team is disposed as in the accompanying diagram (Fig. 7), and the

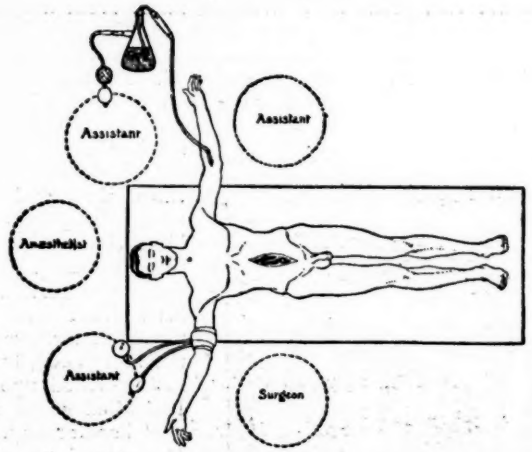

FIG. 7.—Diagram showing the disposition of the team during an abdominal operation accompanied by blood transfusion. The blood pressure and pulse rate are systematically recorded during the operation.

transfusion is timed to coincide with the stage at which the patient is likely to feel the maximum effects of the shock. If the transfusion is successfully carried out the shock never occurs at all.

Transfusion has, admittedly, not always succeeded in the past in saving patients' lives. The reason for some of these failures has been that either the transfusion was withheld for too long, or, having been given, was not pushed with enough vigour. Two or more transfusions may be necessary in the really serious cases, and hesitation will only stultify the treatment.

GENERAL DISCUSSION.

Dr. F. B. SMITH (Harrogate) wished to draw attention to the still present possibility of alarming reactions following transfusions, in spite of negative agglutination reactions between the cells and serum of both donor and recipient, tested reciprocally. Among forty transfusions this had occurred in one patient, who had altogether four transfusions for a prolonged and severe relapse in pernicious anaemia. Three of the transfusions had been within a period of ten days, the fourth about six weeks later. The two alarming reactions occurred after the third and fourth transfusions, each commencing about half an hour after the completion of the transfusion, and simulating a severe rigor and collapse, with disappearance of the radial pulse.

Professor GRAHAM (U.S.A.) expressed his gratification at the results of blood transfusion in well selected cases. He drew particular attention to its value in cases of severe burns where exsanguination followed by transfusion might be of great service in combating the toxaemia.

Dr. ROBERT PLATT (Sheffield) put in another plea for the use of defibrinated blood. Some of his cases had already been published (*Lancet*, January 23rd, 1926, p. 173), showing that far fewer reactions followed the use of this method. Sir Humphry Rolleston had said that in from 9 to 66 per cent. of cases reactions followed the introduction of citrated blood, but in 66 transfusions of defibrinated blood only 4 patients had rigors, and 3 of these were febrile cases of pernicious anaemia, which were the most prone of all cases to develop reactions. Colebrook and Storer recorded a similar freedom from reactions using defibrinated blood. He disagreed with the statement that citration was the easiest method, since nowadays defibrination was just as simple and did not necessitate an available supply of sterile citrate solution. In 13 cases of septicaemia and pyaemia transfused by this method there was a marked fall of temperature and great clinical improvement in 7, while in 4 others there was temporary improvement.

better to be a nun,' ah! then, my daughters, your company will be ready for extreme unction. Fear this, my daughters, and while you live permit no such change; never consent to it. Nuns must needs have a cloister, but the Sister of Charity must needs go everywhere."

Old influences persisted in this country long after monastic control had passed away, and the new order has only been evolved after many generations of struggle. The stories of old-time hospitals are amazingly variable. Some few are described as well ordered places in fair gardens where, through the simple means of rest, food, and air, natural strength was revived. Of others such details are given as conjure up pictures of horror. We can therefore scarcely be surprised that there still persists in the popular mind a reluctance to enter an institution.

Within the lifetime of some here Florence Nightingale published her classical work *Notes on Hospitals* (1863). The first lines of the preface read: "It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm." Later, after setting out the statistics of the appalling death rate of city hospitals, she writes:

> "Facts such as these (and it is not the first time that they have been placed before the public) have sometimes raised grave doubts as to the advantages to be derived from hospitals at all, and have led many an one to think that in all probability a poor sufferer would have a much better chance of recovery if treated at home."

Cool critical statements such as these give no lively picture of former hospitals. Perhaps the citation of a few recorded facts may properly be used to colour the canvas. In mediaeval times there were market surveyors whose duty it was to seize putrid meat exposed for sale and condemn it as unfit for the consumption of the citizen. A very proper and enlightened provision, you will think, and no doubt you will assume that the market surveyors were enjoined to attend to the destruction by fire of the poisonous stuff. But no. In London, Oxford, and Scottish burghs it was provided that the putrid meat should be confiscated and given to the hospitals! John Bell cites a French author, in later days, describing the work of the surgeon, as stating: "Every patient he takes in hand (do what he will) must die of gangrene." Sharp, a Guy's Hospital surgeon, wrote in 1765: "In hospitals at London, bugs are frequently a greater evil to the patient than the malady for which he seeks an hospital." There are several accounts of moneys set aside for the destruction of bugs in hospitals. John Howard, of prison reform fame, also investigated hospitals, and among his reports of 1789 states of the celebrated foundation of St. Thomas's Hospital: "There were no water closets." Between 1862 and 1867 special wards were opened in "the new part of King's College Hospital" for midwifery cases. Florence Nightingale's committee appears to have been a prime mover in the experiment. She reports in her book on "lying-in institutions" that "every precaution had apparently been taken to render the Midwifery Department perfectly safe." Yet in the five years of its existence the mortality from puerperal fever was 33.3 per 1,000. The wards were closed.

These cases I have cited were not exceptional; they are samples of the average of the times. We to-day know nothing like them. I remember one "buggy" hospital in South Africa during the war of 1900, and the scandal the disclosure caused in Parliament and press; and we are to-day properly disturbed that the death rate from puerperal fever throughout the country is a fraction over 1 per 1,000.

There is clear evidence that mediaeval hospitals as places for the sick were not always "houses of pity." The lepers and the destitute were driven into them. The words of our President, Mr. Hogarth, in his address at Nottingham last July, were not a bit too strong when he said: "The hospital [was in mediaeval times] the lazar-house of the destitute, the place to which homeless and plague-stricken outcasts crawled to die, or into which they were herded if they seemed too noisome and dangerous to be tolerated at large." In the face of such facts of history, can we wonder that any but the most needy ever entered a hospital? For the diligent artisan, the comfortable burgess, the squire and his relations, the nobility and gentry to contemplate that he or his should be associated with one of these places because of his own bodily infirmity would have been held incredible. Therein lay the anomalous state of affairs. The classical hospital, the temples of Aesculapius, was for all. But the later-day hospital as a place for the sick, from mediaeval to early Victorian times, was so bad, since it slew more than it cured, that those who could afford to do so shunned it as a pest-house. The modern hospital is now the best place for recovery of health endangered by serious disease or accident, so that there is no reason why the hospital conception should not revert to the all-embracing completeness of its classical prototype. That is the conception of the modern hospital which I wish to press upon your attention; and then to discuss briefly some of the practical problems that attend it.

The Larger Conception.

The hospital should be possessed by the city, but not be in it. In this regard most of our hospitals are ill placed. The city has grown round and passed beyond them. They are now in the heart of the city. Through their open windows come the unceasing roar of the traffic, the hoots of horns, the screams of trams; and the nurses are at perpetual war with the dust and soot that settle upon everything. What sort of rest is here for the sick? How can the physician carry out diagnostic investigations with nicety in such surroundings? That the hospital should be outside the city is no new idea. It was so in Greece. Petit, in 1786, advocated it for Paris. There was a wave of enthusiasm for the idea in London a score of years ago. Yet to-day, when a renowned hospital is reported to be "falling down," it is to be rebuilt on its old site, despite the facts that the residential population formerly about it has gone and that there is a string of hospitals on the road line from east to west of it.

The unit hospital looks upon its neighbour rather as a rival than as a co-worker. If there were combination instead of isolation then surely by this time we should have hospitals for in-patients at strategic points without the city linked to an inner ring of institutes where consultations were held, with clinics for special purposes, for school children, tuberculosis, venereal disease, mental disease, and the like. This is the ideal; it would be economical in the highest degree in the saving of space, and in the speedier relief of sufferers. I view with alarm the growing tendency to the establishment of isolated clinics for this and that disease, just because it is an administrative convenience to the civic authorities. Medicine has no watertight compartments, and the attempt to make these divisions is destructive of good medicine; for the patient may be treated for one complaint, whereas a larger view might show that the complaint was a secondary symptom. Combination is the essence of civilization, and of medicine; isolation is barbarous.

Cottage hospitals are far too much isolated. They should be linked up with larger hospitals. For want of facilities for consultation and transfer, the patient who has energetic friends cuts the local connexion and betakes him to the town, so that knowledge of the stages of his illness is lost—it is divided between several practitioners. There are attempts in the direction of combination now being evolved in this country; it has been developed to a high degree in Christchurch, New Zealand. To-day for the most part the doctor's work is chopped into small pieces which he cannot fit together. The home doctor, the tuberculosis officer, the venereal disease expert, the hospital physician and surgeon do not meet as a matter of course. Whereas in a co-ordinated scheme they would.

In the isolated unit hospital until quite recently it seemed as though the aim was to limit the staff to the smallest number that was thought able to do the work; now better ideas prevail, and staffs are enlarged so as to include as many as can be economically employed. Selected staffs of trained practitioners there must be in any large organization. The cottage hospital, so long as it remains a cottage hospital, may be, and should be, open to every

In the experiments on rabbits such changes in the thyroid and adrenal have been found, and would appear to account for the failure of insulin action after diphtheria toxin. There is much evidence that in all infections there is a stimulation of these two glands, which would account for the increase in the severity of diabetes and the failure of insulin, either relative or absolute, so constantly found in infected conditions in the diabetic. Furthermore, there is evidence that the same disturbance of carbohydrate metabolism takes place in a much slighter and less noticeable degree in normal individuals who are suffering from infections. Such evidence will be considered in detail in the more complete description of these experiments shortly to be published.

Further Clinical Evidence.

An analysis of the cases of diabetes recorded as being resistant to insulin and not responding to it in the usual manner also affords evidence that the thyroid and adrenals are the usual agents which antagonize the action of insulin in these "insulin resistant" cases. Apart from cases of diabetes with infections which do not respond to insulin in the usual way, a number of cases are recorded which require enormous doses of insulin to obtain the usual therapeutic effects. Many of these cases were definitely complicated by hyperthyroidism, and most of the others seemed to be of the nervous excitable type which we may justifiably associate with overactivity of the sympathetic nervous system, probably caused by the thyroid or adrenal or both acting together. I have recently had a case of severe diabetes in whom the onset of hyperthyroidism (Graves's disease) produced coma in spite of the usual dose of 60 units of insulin a day, and required 140 units a day to control the blood sugars on a constant diet. The use of iodine to control the hyperthyroidism reduced the insulin requirement to the previous amount, and the withdrawal of the iodine again increased the insulin requirements.

An attempt has been made to control the overactivity of the sympathetic nervous system complicating diabetes by the use of ergotamine. But although evidence has been obtained that it does decrease sympathetic activity and so increases insulin activity, it would appear to be impossible to give it to man in sufficient doses to exercise any appreciable therapeutic effect on diabetes.

Conclusions.

It is suggested from experimental and clinical evidence that toxins and infections antagonize insulin action by a stimulation of the thyroid and adrenal glands. These glands are direct physiological antagonists to insulin action, and their overactivity makes diabetes worse and prevents the usual action of insulin.

The effect of various toxins and infections in this respect is being investigated. But the evidence in support of the above hypothesis seems sufficiently clear to warrant this preliminary communication.

THE MODERN HOSPITAL CONCEPTION.*

BY

N. BISHOP HARMAN, M.A., M.B.Cantab., F.R.C.S.Eng.,

SENIOR OPHTHALMIC SURGEON TO THE WEST LONDON HOSPITAL, ETC.

The characteristics of hospitals have varied according to the time and place of their working. Our present-day ideas and practices may seem strange to our sons' sons a hundred years hence, just as our achievements would most certainly be amazing to our forefathers of a hundred years ago.

In discussing the modern hospital conception it will be well to keep in mind ancient practice. There is a stimulus in the reminder of the high ideals that have been evident even when hospitals were as bad as they well could be. Further, the remembrance of the diversity of aim displayed by the founders of old hospitals will prevent us falling into the bad habit of thinking that some one line of policy, and particularly the one we are familiar with, is the one and only policy to be countenanced. The study of history has this sure advantage—we shall discover such a wide range of precedents for diversities in practice that we are encouraged to take wide views of present-day practice and what may come out of it.

Early Hospitals.

There seems a common belief that hospitals are, and have been always, places for the treatment of the sick poor; also that they only came into being during the Christian era. It would be foolish to deny that both these beliefs are substantially true. There has been a dominance of the idea of the "house of pity" in the hospital, and pity has been a characteristic mark of Christianity. Yet in point of fact both these beliefs are wrong. The origin of the word "hospital" shows that hospitals were not primarily places for the sick, and we in this country use the word for other purposes. I have only to call to your mind three celebrated hospitals founded within the mediaeval city of London, and still existing in much their original form, to prove the diversity of usage of this word: Christ's Hospital on one side of Smithfield, and St. Bartholomew's Hospital on another, and the Royal Hospital of St. Katherine's by the Tower—all three famous throughout the country. Yet the first of these was and is a school, the second a place for the sick poor—for the "recreation of poor men"—and the third an almshouse. A very proper trinity of benevolence, all covered by this one name. And these three are by no means exceptional; many more such throughout the country survive to this day.

Again, places set apart for the treatment of the sick were not always "houses of pity," places for the sick poor; neither are they always so now. The temples of Aesculapius, whose staff we claim as our ensign, were the classical prototypes of what a complete hospital might be. There were within the precincts sick wards, bathing establishments, gymnasia, libraries, sleeping porches for guests, a theatre, and the temple proper. The provision was as wide in its embrace of human needs as the most modern of spas. I do not think we could do better than keep in mind this ancient practice in building up our own conception of the modern hospital, and particularly the fact that they were not places for the poor alone, but for all classes within the classic city state. To-day in the United States of America, where our mother tongue is spoken by three times as many persons as speak it in these islands, the word "hospital" used in relation to the sick does not mean solely a house of pity; all classes look upon it as indicating a place for them if and when necessity arises.

Houses of Pity.

In this country there hangs about our idea of the hospital an obsession that is an inheritance from mediaeval tradition. Most of our hospitals, when places for the sick, were houses of pity, founded by pious benefactors, who in the current thought of the time sought to make expiation for their sins by their benefactions. These foundations were for the most part under ecclesiastical control, and their value to the community rose and fell with the purity and corruption of monasticism. The ideas that arose from false conceptions of sanctity and the rigid conventual isolation of the servants of the sick in olden times cannot be better illustrated than by a reference to the dictum of St. Chrysostom, the founder of one of the earliest Christian hospitals, to whom we owe one of the most beautiful of the prayers in Christian books of devotion, which fittingly finds a place in the English Book of Common Prayer; this saintly man tried to persuade the deaconesses under Olympia to go unwashed! The struggle between sanctity and soap lasted long. A thousand years later we find St. Vincent de Paul, the reformer of French hospitals, protesting against the isolation of the nursing sisters which put them under the influence of the priest rather than the physician. He said:

"My daughters, you are not religious in the technical sense, and if there should be found some marplot among you to say 'it is

* Read at the inaugural meeting of the Windsor Division, October 15th, 1926.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

PYLORIC STENOSIS.

THE following case seems noteworthy on account of its comparative rarity and rapid recovery under diet and without operation.

A female infant showed all the clinical features of congenital pyloric stenosis. The child had been under other treatment, but the history of the earlier weeks is given by the father, who has proved himself a careful observer. The child, which was born on December 9th, 1925, and was breast-fed, began to vomit during the third week; at first this occurred occasionally, but later after every feed. The bowels became constipated and the child began to show signs of wasting. The treatment had consisted in starvation for a period of twenty-four hours, glycerin suppositories, and various medicines by the mouth. The weighings, though not accurate, are not without significance: Birth, 7¾ lb.; 22 days, 9½ lb. (with clothes); 26 days, 8¼ lb. (with clothes).

I saw the infant first during the eighth week and advised that it should be put to the breast for fifteen minutes every three hours (daytime) and four and a half hours (night-time). Grey powder thrice a day and sodium citrate between meals were given. During the first two days the child vomited every feed. Vomiting was expulsive in character and contained much mucus. On examining the abdomen visible peristalsis was very marked after feeding and the pylorus was easily palpable.

The diet was altered to ten-minute feeds every two hours (daytime) and every three hours (night-time). Sodium citrate was continued, while the grey powder was substituted by maglactis as being more easily given. The result was that vomiting became less frequent though more copious, indicating more than one feed. It frequently took place as soon as the child was put to the breast. The bowels were becoming less constipated.

On February 8th the weight was 8 lb. The bowels kept moving on an average thrice daily. During the following week vomiting was reduced by about one-half and the child had put on three-quarters of a pound in weight.

To satisfy the parents that the feeding was not at fault it was agreed to give alternate feeding, using as alternative cow's milk dilution. Sodium citrate and maglactis were continued as before, but were given immediately before the feed. The result (a week later) proved that the patient showed no partiality towards artificial feeding, as vomiting was as frequent after the bottle feed as after the breast feed. During this week the child lost a quarter of a pound in weight.

On February 28th breast-feeding alone was adopted, being given for six minutes every two hours with two night feeds; during this week the child vomited on four occasions only and the weight increased by three-quarters of a pound. Thereafter vomiting gradually ceased, and the weekly weighing records were as follows:

March 7th, 10½ lb.; March 14th, 11¼ lb. The diet was now changed to nine-minute feeds every three hours (seven feeds in twenty-four hours), with the following result. On March 21st the weight was 11¾ lb.; on March 28th, 12¼ lb.; on April 4th, 12¾ lb.; and on April 11th, 13¼ lb.

The giving of the slightly laxative antacid before feeds seemed to have most effect in allaying the discomfort in the stomach as well as counteracting the resulting constipation.

Saltcoats, Ayrshire. A. SMITH GOUDIE.

PULMONARY EMBOLISM FOLLOWING CHILDBIRTH.

IN the BRITISH MEDICAL JOURNAL of November 6th (p. 835) two cases of pulmonary embolism following childbirth were recorded. A case very similar to that reported by Dr. Young came under my care two years ago.

A strong, healthy primipara was delivered of a full-time healthy girl, quite normally, and exactly ten days after she had a small pulmonary embolism. Fortunately it did not prove fatal, but her life was in danger for several days. Unfortunately she developed a very bad bedsore through being kept perfectly still for a time in a half-reclining position.

Wolverhampton. F. D. SPENCER, M.R.C.S., L.R.C.P.

The memorandums by Drs. McCulloch and Young may, in conjunction with the case described below, lead general practitioners to believe that pulmonary embolism following childbirth is perhaps not so very rare.

A perfectly healthy woman, aged 22 years, whom I had known all her life, was delivered of a healthy living female child on June 8th. On reaching the patient's house I found that the head was already distending the perineum, and the labour was over within forty minutes of my arrival. The perineum was not torn, the discharge at the time and on succeeding days was never profuse, the uterus behaved normally, the patient felt well and looked well. I intended to allow her up on the usual tenth day as her pulse and temperature remained uniformly normal up till the ninth day. Between my visits on the ninth and tenth days the patient had complained to her attendant of a slight pain in the right thigh, but this had passed off within half an hour. On my visit on the tenth day I carefully examined the whole limb, but found no sign of any interference with the blood supply. As an extra precaution, however, I did not allow the patient to rise until the fifteenth day, by which time she was very anxious to get rid of me. On the fifteenth day she rose and remained up for almost an hour, feeling perfectly well and being actually unwilling to return to bed after what she was now considering an unduly prolonged rest. On the sixteenth day I saw her at mid-day; she was well in every respect and I allowed her to rise for two hours. At 2 p.m. she rose, and while in the act of dressing fell to the floor, and was lifted into bed, where I saw her at 2.20. I remained with her until she died at 3.45 p.m.

There could be no doubt of the diagnosis being pulmonary embolism. How many more cases within recent years could be quoted with this one and that given by Dr. Young?

Buckie. J. A. DAWSON, M.B., Ch.B.Aberd.

FRACTURE OF METACARPAL BONE.

A YOUTH showed me his hand. The distal end of his right fifth metacarpal bone was swollen and painful. He gave no history of injury. From external examinations and an antero-posterior *x*-ray photograph it was decided that there was no fracture. The part was rested, though not splinted. The opinion formed was confirmed when, a few days later, the swelling took on the appearance of abscess formation. Poultices were applied and the "abscess" cleared up, although one day I thought it was going to point. The pain and swelling thereafter varied from day to day, and tuberculosis of the bone was thought of. Then antero-posterior and side-to-side *x*-ray photographs were taken, and it was seen that the bone was broken. There is now union with deformity, but a useful hand.

I was puzzled as to the appearance of abscess formation until I read in Scudder's *Treatment of Fractures* (p. 378) that in fractures of the metacarpals "a suppurative process may complicate recovery even when the fracture is not an open one."

CHARLES J. HILL AITKEN, M.D.

Kilnhurst, near Rotherham.

OEDEMA ARTEFACTUM.

NOTWITHSTANDING that a good deal of useful information is supplied in textbooks about dermatitis artefacta—and about graphodermia, which latter condition, as is well known to dermatologists, renders the production of a feigned eruption so easy—there occur cases so out of the common as to deserve record. Take, for example, this case about which I was recently asked to give my opinion:

A young girl presented on the back of each hand an almost symmetrically placed patch of oedema. After careful examination I came to the conclusion that the lesions were artificially produced by the mouth. The girl is the subject of graphodermia. The backs of the hands were puffy. The lesions were the size and shape of the half-opened mouth. The epidermis was slightly moist but otherwise quite normal. The abrupt margin of raised bleb-like centre was well defined, and around it was an area of reactionary redness, due to released pressure. This redness resembled the shape of a big letter "O"—that is, it was composed of two laterally placed crescents (lip-shaped) meeting in the longer diameter of the lesion. The swellings were disappearing rapidly to leave a normal condition of the skin. There could be no doubt whatever that the mouth had been used as a cupping instrument—that is, there had been suction by the mouth and pressure by the lips. No area of the body is more accessible to the mouth for such a purpose.

This case recalls to my mind a much more serious one of factitious oedema, which I saw many years ago.

I found a girl, well grown, aged 17, confined to bed with an enormously swollen left arm. When I took hold of the arm my fingers sank in. It was white, cold, and very heavy. There were several deep incisions oozing serum from pale pouting granulations. These incisions had been made for supposed phlegmonous erysipelas. Amputation of the limb had been talked of. On uncovering the shoulder I found a deep groove round the limb just below the deltoid. At several spots there were vertical streaks of subcutaneous haemorrhage. I asked for and procured the elastic band with which the constriction had been produced, called the girl's mother, and told her that, as self-mutilation was a crime, a policeman, not a surgeon, should be sent for, if the trick were repeated.

Not long afterwards the girl married, and in due course became a happy mother of healthy children.

London, W.1. ALFRED EDDOWES, M.D.

qualified and reputable practitioner in the area. In a general hospital of a city such arrangements would be impracticable; it would mean disorder and injury to patients. The wise man knows his own limitations; he does not want to dabble with costly radiographic apparatus or attempt operations the like of which he has never seen. Nevertheless, there is still room for the expansion of our big hospital staffs. I read that in New York City a census taken on the 1921 directory showed that of 8,760 physicians practising in the city no fewer than 3,232, exclusive of consultants, had affiliations with hospitals in the capacity of visiting or assistant visiting physicians or surgeons. This constituted 36.8 per cent. of all registered medical practitioners in the city. Again,

"There exists no absolutely 'closed' staff, as every hospital (outside of purely research institutions) has a so-called 'courtesy' staff consisting of men who are given the privilege of sending in private patients and attending them at the hospital. . . . These privileges refer almost invariably to private or semi-private accommodation and very seldom to public wards."

The association of more doctors with hospital work is shown by this citation to be bound up with the enlargement of the hospital idea, that it should no longer be for the sick poor only but for all. The limited "house of pity" conception ought to be dead, but it dies hard. It is damaging to the hospitals, to the profession, and to the public. Osler wrote in 1908:

"It has always seemed to me a radical defect of the English hospital system that, as a rule, no provision is made for pay patients. Not only should the class . . . with moderate means be allowed to use the general hospitals on special occasions and pay what they could for services, but it would be an immense boon to extend the privileges of the hospital to the well-to-do classes by the establishment of pay wards."

Now, nearly twenty years later, there is a move, in a small way, to meet this radical defect. It should be our endeavour as a profession to foster it in every way. In the next few years the growth of such accommodation will, I believe, be rapid. Legislation is foreshadowed for the registration of nursing homes, with a view to the improvement of these places for the sick. Improvements cost money. It is likely, therefore, that some of these homes will go out of business from inability to meet new capital outlay. The existing accommodation, especially that which the middle classes can afford, will become more limited; and just at a time when domestic difficulties render the care of the sick at home less possible. The demand for hospital accommodation, pay wards, or special hospitals will certainly increase.

The out-patient department is still a blot upon our hospitals, albeit less now than formerly. It is a relic of the bad old times when pauperism was normal for the major part of the population. The caustic comment upon this indiscriminate medication to be found in the minority report of the Poor Law Commission is not too severe. It may be said that it should be banned in its present form, since it is in conflict with the principle of Florence Nightingale: "the very first requirement in a hospital that it should do the sick no harm." There is now no need for it except for consultation purposes, since insurance and provident practice is so thoroughly established and efficient in its working.

Questions.

There are certain questions that will inevitably arise when we consider this modern hospital conception.

Will such a scheme increase hospital abuse? I think it will end it. When the hospital receives all classes of patients—poor, part-paying, and wholly-paying—what is called hospital abuse will disappear. An efficient almoner system (such as we are developing) will place each patient in his proper category. Individual hospital abuse is, in my experience, declining. The grossest abuse now arises from the exploitation of hospitals by wealthy corporations; with this I will deal later.

Will the larger hospital conception endanger provision for the poor? By no means. I think it will enhance it. It most certainly will give the poor confidence in an institution to which all classes resort—themselves, the workers of all kind, and even the rich.

Will such a scheme mean State control? I think it will prevent it. Closer organization in the working of our voluntary hospitals would so secure them in their pre-eminent position that State hospitals would be likely to be drawn into their wake for their own good.

Will it mean a loss of local interest and therefore of benefactions, especially if the State helped such a scheme financially? I do not think so. The better the scheme and its working the better the appeal it makes. It seems to be assumed by some that State grants mean the automatic loss of gifts and subscriptions. I should like to see the evidence of this. We do not find it true of the universities. Even county council schools have received benefactions! It is not true of the societies for the blind, for though in the last five years State grants have increased tenfold, private benefactions have steadily increased. It is not true of New Zealand, where a State hospital system, under semi-independent control, has received large benefactions.

Will such a scheme mean the general remuneration of the staffs? Yes, undoubtedly. You cannot have paying patients in a hospital, whether they pay in part or in whole, without depriving the staff of some of their means of livelihood. The medical members of hospital staffs must live, even as others, on their work. The proposition is no new thing. There is found among the records of St. Bartholomew's Hospital, in the time of Harvey, this minute:

"That Dr. Andrewes be now advanced to be also an immediate physician to this hospital, and to have the salary or yearly fee of £33 6s. 8d. for his pains."

There is a good custom in vogue in at least one New York hospital.

"The highest salaries are paid to the younger members of the visiting staff. The basis for this is that the younger members give more time to the institution; when they become older and their income from private practice increases, their salary is decreased. The other consideration is that it relieves the younger men to a certain extent from their bread-and-butter worries and makes it easier for them to apply their time to research and study."

Hospital Abuse.

Earlier I said the grossest form of hospital abuse was that due to the exploitation of hospitals by wealthy corporations. I will now justify this statement. There is an ever-increasing number of cases admitted to hospital as out- and in-patients because of industrial accident or disease. These patients are under the protection of the law as regards compensation for loss of wages during illness or loss of earning power thereafter. But there is no provision for their treatment other than by their insurance doctors. The gap has to be filled by the hospitals at the expense of the charitable and of the hospital staffs. Another group of cases come into hospital suffering from street accidents. In both groups of patients a third party is interested in, and benefits by, their speedy recovery—the wealthy insurance companies. But it does not seem to have occurred to them, or with rare exceptions, that they have a duty to the doctors who step into the breach and tend these patients. There is ample precedent for such an arrangement, and failing one arrived at by friendly adjustment we should seek an amendment of the law. In New York State it is provided by law that the party responsible for compensation shall also pay the hospitals and the medical staffs for the treatment of these cases. There can be no doubt that at the present time shareholders of insurance companies are profiting at the expense of the hospitals, and the private benefactions which we may hope these shareholders make do not indemnify them against the charge of exploiting charities and the medical staffs of those charities for business purposes.

Mr. Chairman, that concludes my address. My aim has been to present a conception of something better than we have to-day, wonderful as that is when it is compared with a past that is possibly within the memory of some here.

in every respect by simple examination and the general health was good, the condition of the other kidney and its power to function was assured. He reminded the meeting that the President had been the first to emphasize the importance of unilateral diuresis as a constant sign of renal trouble.

Dr. L. L. CASSIDY referred to the difficulty of finding tubercle bacilli in the bladder, and said that in gynaecology not many cases of tuberculous cystitis were found, though watch was kept for it.

Sir WILLIAM TAYLOR said that once the diagnosis of tuberculosis had been made, if the disease was unilateral, the kidney should be taken out, but he agreed that tuberculin was valuable when both kidneys were involved. In a case he had treated both kidneys had been involved; tuberculin was given, and the patient now had three healthy children, there had been no recurrence, and it was fifteen years since the first attack. He would always use tuberculin when both kidneys were diseased and when it was doubtful whether the second kidney was involved or not.

Dr. F. S. BOURKE reported the case of a woman, aged 26, from whom the left kidney had been removed owing to tuberculosis eight months previously. Before operation she passed urine every hour, day and night. After the operation she obtained relief for three months, but the condition then became as bad as ever again, and the urine contained tubercle bacilli, pus, albumen, and *B. coli*. Caprokol had been tried and also tuberculin, but without benefit. Tuberculin even in small doses raised the temperature and caused pain. The patient was now having sodium morrhuate and ultra-violet rays, and only passed urine every two and a half hours.

Mr. H. S. MEADE, referring to a case cured by Mr. Fullerton in which the bladder was very rigid, said that he would group this among cases of submucous cystitis. He himself had had two cases similar to that one reported by Mr. Fullerton, but there had been no tubercle bacilli present, and the main symptom had been frequency of micturition. In one case it was impossible, even under spinal anaesthesia, to dilate the bladder more than to hold four ounces of urine. The patient was subsequently examined in London, and told that the condition was one of healed tuberculosis. He had found tuberculosis of the bladder more common than ulcers of the bladder. In cases that were definitely tuberculous, the catheter should not be passed up to a kidney that was functioning normally. He used indigo-carmine for testing, and the results from it were just as good as those with any other test.

Mr. FULLERTON, replying, said that he had removed the kidney in 71 cases in which the disease had been unilateral clinically. He never took away the kidney if pus was found on the other side. In addition to these 71 cases of which he had kept a record, he had removed tuberculous kidneys in a great many other cases, and this had confirmed the fact that in the large majority the disease was unilateral, though the absence of pus or tubercle bacilli was not positive proof of the integrity of a kidney. If the second kidney became involved it was not for some time, as he had seen cases going on for twelve years in which he had been satisfied that the other kidney was normal. Any examination of the bladder in a case of tuberculosis was attended with risk, but disasters did not happen very often in his experience. In emptying the bladder care must be taken that there was no pressure which would send up infected material into the kidney. Typical tubercles in the bladder were not very commonly found, and when definitely present the patients did not as a rule do very well. Ulceration might not be produced by tubercle bacilli but by their toxins. In Belfast the results obtained in these cases by the injection of tuberculin had not been very good. The thickened ureter in cases of tuberculosis was due to inflammatory fibrosis involving the mucous membrane. Where there had been hypertrophy of the bladder, the kidney on the opposite side became dilated because of the difficulty in entering the bladder. Unilateral diuresis was not mentioned in any textbook, and yet this condition was certain to be found in cases of tuberculous disease even in the very earliest stages, and was, indeed, a way by which it was possible to diagnose a tuberculous condition. He himself did not depend on nephrectomy in cases of infection of the prostate, and thought it difficult to assess the value of nephrectomy against tuberculin in their treatment. When one kidney was sound, and yet the other kidney did not clear up, mild irrigation might be tried. He had tried indigo-carmine and found it useful, but it was necessary to get very accurate information about the kidneys; this could not be obtained by colour tests, since staining by pus or blood was likely to occur.

SPASTIC PARALYSIS IN CHILDREN.

A MEETING of the Manchester Medical Society was held on November 3rd, with Dr. ALFRED A. MUMFORD in the chair; a discussion on spastic paralysis in children was opened by Dr. JOHN F. WARD.

Dr. Ward said that spasticity was difficult to define, but signified an increase of muscle tone, and was an indication of an upper neuron lesion. Such lesion explained easily the loss of voluntary power of muscles supplied by the affected nerves. Associated with spastic paralysis in children more frequently than adults were athetosis, choreiform movements, and perverse movements; these were explained by the unrestrained activity of extra-pyramidal tract owing to a pyramidal lesion. There had been much recent discussion as to the cause and control of muscle "tone," called "postural contraction" by Sherrington. It was certainly dependent upon the afferent impulses forming part of a reflex arc because division of the posterior nerve roots affected it. Tone was also influenced by the cerebellum, the corpus striatum, and, according to the work of the late Professor Hunter of Sydney, by the sympathetic nervous system. The following varieties of spastic paralysis in children were known: a diplegia group; a paraplegia group, including cases due to the same cause as that of diplegia, family and hereditary paraplegia, and paraplegia due to lesions of spinal cord and its membranes; hemiplegia; amaurotic family idiocy. The chief clinical manifestations of diplegia were spasticity of the legs, with adductor spasm, and often unrecognized until the child was several months old: some mental defect was present in most cases, but very variable in degree. The blindness in some cases was either cortical or due to optic atrophy. Convulsions might occur, but not so frequently as in hemiplegia; involuntary movements were also less common. There was a tendency to some improvement in a large proportion of cases. The two principal schools of opinion regarding etiology related it with intracranial haemorrhage or injury, and primary neuronic degeneration. Little had believed asphyxia was the cause; later opinions assigned it to meningeal haemorrhage (McNutt, Gowers, and Osler), prematurity (Brissaud), and intrauterine degeneration of neurons (Freud and, later, Collier). In 60 per cent. of cases it was associated with abnormal labour, whether difficult labour, asphyxia, prematurity, or precipitancy. The work of Herbert Spencer, Eardley Holland, and others showed the great frequency of intracranial haemorrhage in still-born infants and those dying shortly after birth; injury and asphyxia were frequently combined in difficult deliveries. The haemorrhage was chiefly intradural and most frequently diffuse; it might be only petechial. Many patients died soon, but those that recovered might not show evidence of involvement of pyramidal tracts for some months because the pyramidal tracts were developed later. Necropsy evidence of diplegia cases supported Collier's view, but Schwartz had shown that atrophic sclerosis might follow haemorrhage. Syphilis was not an important cause; the Wassermann reaction was negative in most cases, and other symptoms of congenital syphilis were absent. Infantile hemiplegia was probably quite different pathologically in most cases. The onset was most frequently later than diplegia, and was most common between the ages of six months and two years. Convulsions and febrile disturbances occurred at the beginning of most cases; the convulsions might be due to the same cause as the hemi-

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TUBERCULOSIS OF THE BLADDER AND KIDNEY.

At a meeting of the Section of Surgery of the Royal Academy of Medicine in Ireland, on October 29th, the President, Mr. ANDREW FULLERTON, read a paper on the investigation and treatment of tuberculous bladder and kidney, based on 150 personal cases.

Mr. Fullerton said that the existence of primary tuberculous disease of the bladder had been denied, but he had seen two cases of tuberculous bladder in which no evidence of disease in either kidney could be obtained. It had been stated that tuberculosis of the epididymis was an antecedent to tuberculosis of the kidney; he believed that the reverse process was the more probable sequence. He had been struck with the apparently healthy appearance of many patients with genito-urinary tuberculosis. Some had had antecedent disease elsewhere, such as tuberculous glands of the neck, pleurisy, hip-joint disease, spinal caries, and pulmonary tuberculosis. Some lived for many years, but others from frequency of micturition and loss of sleep soon became exhausted; in such cases a nightly rise of temperature was usual. Mr. Fullerton had found frequency of micturition the most prominent symptom; though remissions occurred, the course was progressive and eventually terminal haematuria supervened. Renal pain resembling renal colic might be the first symptom; it was present in about 50 per cent. of cases. In a very few cases severe renal haematuria had been noted, but more frequently the blood came from the bladder. The finding of tubercle bacilli in the urine was strong presumptive evidence of tuberculosis, but in a few cases the bacilli were found and a subsequent history entirely negatived the diagnosis of urinary tuberculosis. If tubercle bacilli were present in the urine further investigation should be made. In males the testicles should be examined and rectal examination made to discover the condition of the prostate, the vesiculae, and the lower ends of the ureters. In females a thickened ureter might be discovered. The condition of the bladder and kidneys might be ascertained by cystoscopy, though sometimes this was difficult and not unattended by risk. Cystoscopic appearances varied. The affected ureteric orifice, at first showing slight redness or oedema or some change in shape, might be darker or more patulous. Later the "golf-hole" appearance might be seen. Systole and diastole might be abolished, the ureteric orifice advancing in inspiration and receding in expiration. In late cases ulceration had often been found. Grey tubercles, small papillomata, and small cysts were rare. The bladder wall might show general cystitis, isolated patches, a ringworm appearance, or typical shallow ulcers. The affected kidney could be detected, not only by ureteric meatoscopy, but by chromocystoscopy, and in most cases ureteric catheterization. Special stress was laid on unilateral diuresis and on tests for the specific gravity reaction. Slight albuminuria on the good side was disregarded after the diseased kidney had been removed. Where cystoscopy or ureteric catheterization was impossible the good ureter was exposed in the iliac region and catheterized through a small slit. Pyelography was useful as a confirmatory test, but was not devoid of risk.

Mr. Fullerton said that further experience had not altered his view that operation was the correct treatment; it convinced him that clinical cure was not impossible in certain cases. Medical treatment, including good hygienic surroundings, might cure a patient, but the outlook was much less satisfactory than that afforded by surgical treatment. He had removed seventy-one kidneys for tuberculosis with five deaths; the last thirty-six cases were without operative mortality. Details of several cases were given illustrating the excellent results obtained.

Sir ARTHUR BALL thought Mr. Fullerton had been fortunate in the number of cases of unilateral renal tuberculosis that he had met with. He himself believed that since the infection was generally haematogenous, both kidneys would be expected to be involved. He had found that in the early cases only one kidney was infected, but in later cases both. If the infection was an embolic one this would account for the second kidney not being involved in early cases. He thought it was very hard to foretell the duration of life in cases of double renal infection. A patient of his own who developed typical tuberculous cystitis while home on leave went back to India, became completely free of the disease, and remained so for nine years. After that time the epididymis and the prostate became affected and renal colic set in, during which the patient passed no urine for about five hours, till the colic had ceased. He thought that the presence of typical-looking tubercles in the bladder was commonly met with, but was one of the later symptoms of the disease. In some cases cystoscopy was difficult and also risky.

Mr. SETON PRINGLE dealt with the value of tuberculin in renal tuberculosis. In earlier days he had used tuberculin for many conditions, but now, as the result of experience, he confined its use almost entirely to the treatment of tuberculous glands and tuberculosis of the genito-urinary tract. He had come to look on it as an invaluable aid in the treatment of the latter condition, and ordered it with absolute confidence of beneficial results. The preparation used was either the new T.R. or B.E., commencing with very small doses, about 1/10,000 mg., and gradually increasing until in six or nine months' time the patient was getting as much as 1/100 mg. a week. He divided cases into three categories: (1) where the disease was definitely localized to one kidney and nephrectomy was the treatment of choice; (2) where the disease was bilateral and the patient could only be treated on general lines and by tuberculin; and (3) where at the first examination it was impossible to give a definite opinion as to the extent of the disease, either because a very irritable contracted bladder precluded a satisfactory cystoscopic examination, or because, although a good view might be obtained, the inflammation was so widespread that it could not be determined whether one or both kidneys were infected. He did not catheterize the ureters in these cases, as he believed the passage of a catheter through an infected bladder might possibly carry infection up a ureter previously non-infected, and so, in deciding on the condition of the kidney, he depended on the appearance of the ureteric openings, and on the time taken in the excretion of indigo-carmine. In treating cases of bilateral infection and doubtful cases he depended on tuberculin; in the former there was usually a definite improvement in frequency, pain, pyuria, and haematuria, and also in the general health. In a few such cases he had had exceptionally good results. In the doubtful cases improvement almost invariably followed, and, as the inflammation decreased, the patients could be relegated to either the first or second class. In some cases it had become apparent that only one kidney was infected and therefore nephrectomy had been safely advised. In others undoubted evidence was found of double infection, and these were condemned to a long course of tuberculin. Mr. Pringle gave notes of two illustrative cases, and added that he now confidently looked forward to improvement, and possibly even cure, in all but the most hopeless cases. In his opinion renal tuberculosis was benefited by tuberculin to an extent not experienced elsewhere in the body, and he regarded it as being of invaluable assistance as an adjunct to, or substitute for, operation.

Sir WILLIAM WHEELER remarked that polyuria on the affected side was an early diagnostic sign; although the specific gravity of the urine from the diseased kidney was low, the increasing quantity resulted in the delivery of the same amount of urea as from the healthy kidney in a given time. He had never seen or heard of a pathological specimen of a healed tuberculous kidney. He believed the disease to be essentially unilateral, and that bilateral infection was a very late phenomenon. He agreed that bilateral disease was consistent with apparent health after a number of years, and that tuberculin was probably one factor responsible for holding the pathological process in check. The passage of micro-organisms through the kidney and their presence in the urine was not always a sign of disease; bacilluria might occur in health. He thought that one of the most satisfactory cases to deal with was the patient with a large tuberculous kidney in which the ureter had become blocked. If the urine was found normal

colic, as it should be called, might be complicated by a mild form of true colitis as a result of daily irritation by injudicious local treatment.

In true colitis the mucus always contained pus cells, and in the severe forms small quantities of pure pus could often be recognized in the stools. The presence of blood recognizable with the naked eye generally indicated the presence of ulceration, but smaller quantities might be present in acute colitis without actual ulceration. When the source of blood and pus in the stools was the inflamed mucous membrane of the colon, the stools were always soft and generally liquid. In the typical stool of ulcerative colitis isolated patches of liquid faeces, mucus, pus, and blood could generally be recognized, in addition to muco-pus and pus stained with blood. The presence of solid fragments of faeces in such a stool would point strongly to the presence of a growth. When blood was passed alone or on the surface of lumps of solid faeces, together, perhaps, with a little mucus or muco-pus, colitis was certainly not the cause, and a local source in the anal canal or rectum should be suspected.

In most cases the bacterial abnormality in ulcerative colitis was not due to the infection, but to the fluid nature of the stools and the presence of excess of soluble protein, blood, and pus, which formed a culture medium especially favourable for the growth of certain bacteria at the expense of others. Dr. Hurst thought there was no conclusive evidence in favour of any particular organism in the stools being the cause of the colitis. He had been so impressed in 1921 with the resemblance between the appearance of the colon seen with the sigmoidoscope in bacillary dysentery and in sporadic ulcerative colitis that he had revived the suggestion made by Saundby in 1906 and Hawkins in 1909 that the latter might also be due to infection with the *B. dysenteriae*, but in no case had the organism been isolated from the stools or from swabs taken directly from the ulcers through the sigmoidoscope, and in no case had the patient's blood agglutinated any of the known strains of *B. dysenteriae*. Dudgeon, however, had isolated the Flexner bacillus from material obtained from the surface of an ulcer through a sigmoidoscope in two cases. In 1924 Barger had isolated a diplococcus from swabs taken through a proctoscope from the ulcers in 80 per cent. of 68 cases of ulcerative colitis, but in only 1 out of 20 healthy patients. Intravenous injections of the diplococcus had produced similar lesions in rabbits and dogs. In a few cases the same organism was isolated from apical dental abscesses and from infected tonsils in patients suffering from the disease. Dr. T. Houston of Belfast had recently isolated a similar organism, but he was not yet convinced that Barger was correct in regarding it as the specific infective agent in sporadic ulcerative colitis. There was some doubt whether the ulcerative colitis from which Barger had isolated his diplococcus was the same disease as that in England. The sigmoidoscope should be considered as much within the province of the physician as the ophthalmoscope. Unfortunately, however, it was still often looked upon as a surgical instrument, with the result that numerous cases of cancer, which could not be recognized without its aid, were diagnosed too late, and a totally wrong conception of colitis was still widely prevalent. Ulcerative colitis could be recognized at the first glance through the sigmoidoscope, but its appearance was indistinguishable from that of bacillary dysentery. Amoebic dysentery presented a quite distinctive picture. When the mucous membrane of the rectum and pelvic colon was healthy, ulcerative colitis could be excluded, as the disease seemed always to begin in the most distal segment of the colon and to persist there longer than in any other part. When, therefore, stools containing blood and pus were passed by a patient in whom the sigmoidoscope had revealed no evidence of ulcerative colitis a growth of the colon was almost certainly present; if situated within ten inches of the anus it should be recognizable with the sigmoidoscope, even if it could not be felt by either rectal or abdominal examination.

When the sigmoidoscope revealed nothing abnormal and the symptoms pointed to the presence of some disease of the colon a barium enema should be given. By this means alone was it possible to recognize diverticulitis, a comparatively common disease, which generally involved the iliac and pelvic colon, and which was formerly almost invariably mistaken for either a new growth or colitis; it was, moreover, the only common cause of pericolitis sinistra. An opaque enema also often showed the presence of a growth at a stage when it was still impalpable and caused no delay in the transit of an opaque meal. An *x*-ray examination after an opaque enema should always be made in long-standing cases of ulcerative colitis which were not responding satisfactorily to treatment, as this might be due to the development of a stricture, the exact position and extent of which could be recognized in no other way. By this means the need for a short-circuiting operation had been discovered in two of his cases, although there was nothing in the symptoms to suggest that obstruction was developing. The extent of the ulcerative process in the earlier stages could also be recognized with the *x* rays after an opaque meal by the disappearance of the normal haustration and the mottled appearance of the shadow.

The high recovery rate following improved methods of treatment had resulted in the occasional development of late complications, which were formerly rare or unknown. Thus the autopsy records of the London hospitals for the twenty-five years ending in 1908 did not contain a single example of stricture following ulcerative colitis. Dr. Hurst had watched this develop in four cases; in two the strictures, which were multiple, were so severe that short-circuiting operations had to be performed before complete recovery could occur. He had also on three occasions watched the development of polypi as the ulceration healed. In a case of polyposis of the colon now under observation there was a long history pointing to a similar origin, and the polypi were still accompanied by severe colitis. It would probably be discovered that most cases of polyposis of the colon originated during the healing of ulcerative colitis. As the polypi showed a definite tendency to become malignant, an intermediate stage of polypus formation was the probable explanation of the development of a growth of the pelvic colon two years after complete recovery from ulcerative colitis in one of his pre-war patients and of cancer of the rectum following chronic dysentery in two others. In one of his cases innumerable small polypi had developed by the time the ulcers had healed; the stools were normal, and the patient felt perfectly well. All the polypi disappeared as a result of treatment with deep *x* rays.

In spite of the complications described most cases of colitis healed completely, healthy mucous membrane developing where at one time confluent ulceration was present. There was often much scarring, but with a magnifying eye-piece the sigmoidoscope showed that this was situated in the submucous tissue, where widespread white scars might alternate with deep red patches of dilated and sometimes stellate blood vessels; the mouths of new-formed crypts of Lieberkuhn could be seen to be evenly distributed over the whole surface of the mucous membrane. Dr. Hurst had recently had an opportunity of observing this condition four years after recovery from an exceptionally severe attack of ulcerative colitis which had lasted for three years.

Treatment.

The patient should be kept in bed until the sigmoidoscope showed complete recovery. As this might require many months a greatly restricted diet, such as one of milk and milk foods, was likely to lead to anaemia and other undesirable complications, which could be avoided by a generous mixed diet, from which everything leaving any solid residue had been removed. When much blood had been lost transfusion was of great value, not only in combating the anaemia, but also apparently by directly increasing the patient's power of overcoming the infection.

In 1919, in the belief that the disease was really an aberrant form of bacillary dysentery, Dr. Hurst had tried the effect of the intravenous injection of large doses of polyvalent antidysenteric serum. In the first case the result was little short of miraculous; a young man, who was almost moribund after being very ill for over a year, and in whom no improvement had followed an appendicectomy, recovered completely in a fortnight. Five days after the first injection the sigmoidoscope showed that the innumerable ulcers seen a few days before had vanished,

plegia, but possibly hemiplegia might arise as a vascular lesion owing to the congestion during the convulsion. There was often some history of infectious disease shortly before the onset. The cases might be due to vascular lesions, atrophy or sclerosis, or porencephalus; atrophy and sclerosis were probably sequels of encephalitis. There was some indication that this was a polio-encephalitis due to the same organism as poliomyelitis, but the evidence was not complete; "encephalitis" was a rather loose term. Treatment of spastic paralysis might be non-operative, including massage and re-education, or operative. Re-education was the most important; massage might soothe hypertonic muscles, but its effect could only be very transitory. Electrical treatment was absolutely contraindicated. Operative treatment consisted of division of the posterior nerve roots (Förster's operation); operations on peripheral nerves (Stöffel), tenotomy, and sympathetic ramisectomy (Hunter and Royle).

Mr. E. S. Brentnall dealt with the principles governing the treatment of the spasticity of childhood. He emphasized the importance, and in some cases the difficulty, of forming at the outset a fair estimate of the patient's educability. In very young children the treatment had to be left largely to the parents; it should consist of simple stretching of the tight structures and elementary postural training. The use of a foot splint during sleep was essential, but prolonged immobilization and splinting were undesirable. Activity and its educative results were of the greatest importance to these children. In older patients treatment should consist of physical training, and should aim at developing the sense of balance and co-ordination of the child. Both physical and mental improvement could be anticipated in patients who were educable. Operative treatment was directed almost entirely to the relief of contractures; it should only be undertaken in children with a fair degree of educability, and not before promising efforts to stand and walk could be made. The speaker insisted that operative treatment in itself did not improve the sense of balance, and might interfere with it if the child was immobilized for long. The most useful methods adopted were the division, lengthening, and transplantation of tendons, and the Stöffel operation. Different methods would be found necessary in different parts of the limbs. In the case of the lower limb the operative treatment of suitable cases could be expected to produce distinct improvement in gait and activity. In severe spastic affections of the hand he doubted whether any tendon operation or nerve section was of real benefit, or could restore any degree of functional capacity to the limb.

Professor Stopford confined his remarks to the investigations into the sympathetic innervation of striated muscle, and reviewed the researches of Hunter, Royle, and others in this field. He submitted proof of the existence of the sympathetic supply of muscle by histological and experimental methods, and then proceeded to discuss the functional significance of the fibres reaching muscle from the autonomic nervous system. It was pointed out that although the theory with regard to muscle tone propounded by Hunter and Royle had been severely criticized, their experimental results, and particularly those on the sea-gull, demanded further consideration and research. There was evidence from their work and that of others that sympathetic denervation had an effect upon muscular activity, and it was necessary to investigate fully what that effect was. It might be, as had been suggested, an indirect effect; the researches of Orbelli on the influence of the sympathetic upon fatigue were significant and might direct them to a correct interpretation of the experimental findings. Professor Stopford also called attention to the fact that several surgeons who had considered the results of the operation of ramisectomy to be of no practical value had admitted that some effect had been produced upon muscular activity in a proportion of the cases. There was a risk of confusing the two problems: the interpretation of the experimental findings and their possible clinical application. Failure to obtain a result of practical value after ramisectomy did not relieve them of the duty of following up the experimental researches. For the immediate future it would be wiser probably to confine attention to a careful analysis of the effects of sympathetic denervation, and a review of the present position seemed to justify the belief that this might lead to far-reaching results.

DIAGNOSIS AND TREATMENT OF COLITIS.

At a meeting of the Section of Medicine of the Royal Society of Medicine on November 23rd Dr. A. F. Hurst opened a discussion on the diagnosis and treatment of colitis.

Dr. Hurst said that a diagnosis of colitis should never be made until thorough investigation had shown that inflammation of the colon—nothing less and nothing more—was present. Examination of the stools was more important than consideration of the symptoms, which were not characteristic. Each stool passed on two or three consecutive days should be inspected by the clinician, in addition to the microscopical and bacteriological investigations made by the pathologist. The stools must be natural, and not obtained after an aperient or an enema. In the colon mucus was normally secreted in order to protect the mucous membrane from mechanical and chemical irritants, and, consequently, hard faeces were likely to be coated with it. Since most aperients acted by irritating the mucous membrane of the bowel, it was natural that, unless the dose was very small, the soft or liquid stools to which they gave rise should often contain mucus, secreted with the object of diluting the chemical irritant and so protecting the mucous membrane from damage. A similar response frequently occurred after injecting fluid into the bowel. The old custom, still followed in some spas, of sending every patient for a trial Plombières douche if mucus was found in the ejected fluid, and diagnosing colitis as the cause of the rheumatism, eczema, or neurasthenia for which the patient had sought treatment, had no scientific foundation, because many healthy colons responded to the abnormal stimulation of the douche by secreting mucus, even though the secretion gradually diminished during the "cure," as the mucous membrane became accustomed to the treatment. Whenever possible Dr. Hurst examined patients with the sigmoidoscope without any preparation by aperients or lavage, which caused the mucous membrane to be slightly redder than usual and excess of mucus to be present, even though nothing more irritating than normal saline solution was used for the douche. The temporary congestion and the secretion of mucus under these conditions were the natural response to the irritant and were not signs of colitis. The mucus secreted with hard faeces and after the use of aperients or enemas contained no pus cells, no red corpuscles, and no excess of broken-down epithelial cells; evidence of inflammation was entirely lacking.

In the condition badly described as muco-membranous colitis, shreds or large membranes of mucus were excreted with hard faeces. Dr. Hurst had never seen the slightest sign of inflammation in patients with this condition, unless they had been treated with irritating douches. Nearly twenty years ago he had suggested that this condition was strictly analogous with asthma, and he still thought that the analogy held good. In asthma over-activity of the vagus led to spasm of the bronchial muscles and excessive secretion of mucus by the bronchial mucous membrane. Owing to the spasm the mucus was retained long enough to coagulate, and as it was slowly extruded along the spiral bronchi it was moulded into the characteristic Curschmann's spirals. In uncomplicated cases there was no bronchitis, and the mucus contained no pus cells or albumin; the secretion ceased abruptly when the spasm relaxed at the end of an attack, whether this occurred spontaneously or after an injection of adrenaline. In the colon the spasm and over-secretion of mucus, which had been shown experimentally to occur on stimulation of the pelvic nerves, were due to similar nervous influences; the mucus, which contained no albumin and no pus cells, was retained owing to the spasm, and was coagulated by a ferment, mucinase, which Roger had isolated from both the bronchial and intestinal mucous membrane. Just as asthma might be complicated by bronchitis as a result of treatment by irritating inhalations, so muco-membranous

mortality was 22 per cent., but most of these were cases of lung abscess, and the mortality of the operation in bronchiectasis would probably be much lower. Important recent work had shown how large a part aspiration of septic mouth secretions, of vomit, and of various extraneous bodies during anaesthesia, especially for operations on the throat and nose, played in the production of suppurative processes in the bronchial tract. Only by keeping the head downwards until the patient had regained his cough reflex could such accidents be avoided. Dr. Riviere referred to the valuable team work at the present time of the "Association of Thoracic Surgery" in America, and added that an annual congress devoted to chest diseases as a whole, and including physicians, surgeons, laryngologists, radiologists, and anaesthetists, would do more than anything else to forward this branch of medical work in this country.

Mr. J. E. H. ROBERTS thought that the surgery of pulmonary infections was in the position of abdominal surgery thirty or forty years ago. Cases were not seen by the surgeon until the larger bronchi were affected and the patients were enfeebled by chronic toxaemia, haemorrhage, and even amyloid disease. He hoped that by closer co-operation of physicians and surgeons it might be possible to treat cases at an earlier stage. Diagnosis was the province of the physician, and it was often difficult, especially in affections of the upper lobes. In cases of swallowed foreign body or of new growth of the lung obstructing a bronchus diagnosis was often impossible for a long time; he mentioned one case in which a swallowed collar-stud had been present for twelve years. There were to-day two methods of exact diagnosis. Direct bronchoscopy was most useful, and probably when more and more cases came to the surgeon the need for a general anaesthetic, usually demanded in this country, would disappear. The more recent advance was due to the work of French colleagues, in particular Dr. Armand-Delille, and consisted in the injection of substances into the bronchi which were opaque to *x* rays. There were three methods of using lipiodol, the substance generally employed: by injection through a bronchoscope, by injection through a long tube with a metal end, introduced into the trachea and guided under *x*-ray examination, and by puncture of the crico-thyroid membrane. Mr. Roberts then described in detail the last method, dealing also with the dangers attached to its use. Coming to the question of treatment, he stated that except in the case of children medical treatment was purely palliative. By active medical treatment life could be rendered tolerable, but relapses were frequent, and no continuous employment was possible; there was also the risk of complications occurring, and the expectation of life was not great. Such considerations, said the speaker, rendered the more severe surgical procedures justifiable, but in every case a course of medical treatment should be tried first. Extensive drainage could only be of use if one or a few cavities were present, and it was therefore limited in its application. Collapsing operations were important; artificial pneumothorax was particularly of value in the early case, and it should be used as a routine in cases of pneumonia where the physical signs persisted. Suppuration was controlled and fibrosis limited, and the good results could be made permanent by some form of thoracoplasty. Phrenic evulsion was sometimes useful as a preliminary to other surgical procedures; it rarely sufficed by itself. Thoracoplasty gave the best results when the lower lobe was affected. Removal of ribs should be free; paravertebral resection was not enough, and anterior resection or complete decostalization should be performed in stages. There were two classes of case in which this operation gave beneficial results: those already benefited by a preliminary artificial pneumothorax, and those in which a great degree of contraction of the affected lung had occurred. Mr. Roberts then quoted cases to illustrate his remarks. He concluded by describing lobectomy and cautery lobectomy, and pleaded for earlier co-operation between physician and surgeon so that collapsing operations could be employed in the earlier stages.

Dr. P. F. ARMAND-DELILLE (Paris) said that after lipiodol injections patients certainly improved, but they usually relapsed. He had succeeded in doing artificial pneumothorax in some cases, and in one case he had performed a bilateral pneumothorax. He raised the question of the possibility of bilateral thoracoplasty operations.

Dr. G. SCHRODER (Würtemburg) said that in Germany bronchiectasis was essentially a disease of childhood, and treatment should therefore be commenced early in life. Good results had been obtained by phrenic nerve evulsion in cases of bronchiectasis of the lower lobes. The results in thoracoplasty were also good, but the operations performed were more extensive that those already mentioned by previous speakers: full collapse was obtained by taking away all the ribs below the scapula on the affected side.

Dr. L. S. T. BURRELL agreed with Dr. Riviere as to the importance of medical treatment. He stated that a patient could be kept alive and healthy for the rest of his life by early medical treatment, and surgical intervention appeared to be only justified in the later and more desperate cases. It was important before beginning treatment to look carefully for the cause of the condition—as, for example, a foreign body, aneurysm, syphilis, or a neoplasm. The throat and sinuses should also be carefully examined. Attention to posture and the use of some form of creosote were very successful in many cases. If improvement did not follow and the trouble was localized to one lobe, artificial pneumothorax or washing out the cavities through the bronchoscope should be tried. This latter method gave good results, and in skilled hands was not painful or very inconvenient. It was found that the cavities thus treated tended to dry up eventually, and the patients were rendered comfortable and able to work. Surgical treatment should not be thought of until the bronchoscopic lavage had been tried. Dr. Burrell thought that thoracoplasty was not so successful as in pulmonary tuberculosis. He knew of one case in which the pulmonary artery had been tied successfully in 1916. Cautery pneumectomy appealed to him strongly as a satisfactory method.

Mr. TUDOR EDWARDS agreed that the value of lipiodol was well established, especially when surgical procedures were contemplated. He thought that artificial pneumothorax would not cure established cases of bronchiectasis, but if good results were obtained thoracoplasty should be employed to render the collapse permanent. He had performed phrenic evulsion in twenty patients with bronchiectasis, obtaining some improvement in almost every case. The cough was diminished, dyspnoea disappeared, and there was more complete evacuation of sputum. He had tried thoracoplasty in eleven patients with bronchiectasis with variable results; in four of these cases the condition of the patients was excellent. He had used cautery pneumectomy in one case, but was not very satisfied with the operation. He thought that cases of post-pneumonic fibrosis should be treated before dilatation of the bronchi was allowed to occur.

Dr. F. G. CHANDLER dealt with some of the difficulties in diagnosis. A patient might have a cough with morning expectoration for some years: evidence of bronchiectasis would be found in recurrent haemoptysis, constant sticky râles in some part of the chest, and absence of tubercle bacilli from the sputum and faeces. The speaker then showed by slides how the differential diagnosis of the condition could be established by lipiodol. He pleaded for better treatment of unresolved pneumonia and for prolonged convalescence of cases after whooping-cough.

Sir PERCIVAL HARTLEY said that bronchiectasis appeared to be altering in its character, and the very severe cases were not common now. Preventive treatment was most important, especially after bronchopneumonia and whooping-cough. He thought that evulsion of the phrenic nerve was harmless, often did good, and should be used. Artificial pneumothorax might be tried in some cases, but he thought thoracoplasty should only be used in a very desperate case. Mr. ZACHARY COPE inquired about the expectation of life in certain cases which had been quoted as living for so many years after certain forms of treatment. Sir JOHN BROADBENT raised the question as to the way in which a bronchiectatic cavity might become infected. It appeared that such infection was more likely to occur after acute pneumonic processes than in cases of bronchiectasis due to pressure on a bronchus.

and nine days later the appearance of the mucous membrane was absolutely normal. In the eight years which had since elapsed he had had no recurrence. Since 1919 Dr. Hurst had used antidysenteric serum in every case, often with excellent results, though occasionally with little or none. He realized that the treatment might really be non-specific and nothing more than a form of protein shock, although in one case it had proved very effective after a series of injections of ordinary horse serum had failed. The dose of serum he now used was 40, 60, 80, and 100 c.cm. injected intravenously on successive days, and then 100 c.cm. for a few additional days. The reaction was occasionally somewhat alarming, but it was never really dangerous. Vaccine treatment did not seem to have any definite influence on the course of the disease. The persistent ulceration presented the chief difficulty in treatment, and it was far from clear what effect the vaccine could have if such ulcers persisted after a course of inoculation. Such infective foci as teeth with apical abscesses and inflamed tonsils should be removed, though severe local reaction had been known to follow the operation. Local treatment of the colon was undoubtedly of use, and Dr. Hurst generally used tannic acid (grs. i or ii to 1 oz.). It was most important that the fluid should be introduced through a soft catheter, which should not be passed more than an inch beyond the anus, as otherwise the rectal mucous membrane was likely to be injured. He gave half an ounce of charcoal and kaolin two or three times a day in the hope that they would absorb toxins; the former certainly absorbed gas, and so relieved colic, and it also deodorized the stools. There was no evidence that any so-called intestinal antiseptic exerted any action in the colon when given by the mouth.

It was of the utmost importance that the stools should not be allowed to get hard during convalescence, and therefore a saline aperient or paraffin should be taken regularly; the former might also reduce the frequency of defaecation in the early stages, and in this way might help to give the patient a less disturbed night. Every patient who had ever had ulcerative colitis should for the rest of his life keep his stools soft and should avoid all food leaving any solid fragments which could irritate the mucous membrane of the colon. The danger of relapse was, however, largely due to the fact that patients were allowed to get up and discontinue treatment when they felt well and the stools looked normal, which was often many weeks before the sigmoidoscope showed recovery. Apart from an occasional short-circuiting operation to overcome the obstruction caused by the development of a stricture in the process of healing surgery was very rarely required, and the results of medical treatment in his series of cases compared very favourably with the statistics of appendicostomy.

The President (Dr. Hugh Thursfield) thought that Dr. Hurst's views on the minor importance of bacterial abnormality in ulcerative colitis applied also to nearly all the other intestinal conditions except such specific infections as dysentery and typhoid fever. The prevalent wild views of this causation needed correcting. He believed that infantile diarrhoea in the autumn was possibly dysenteric, and good results had followed the prompt administration of antidysenteric serums without waiting for a bacteriological report. Many lives had been saved in this way.

Dr. W. Edgecombe (Harrogate) believed that "mucomembranous colitis" was not a true colitis, but a colonic mucorrhoea; it was a neurosis occurring in psychasthenics, and was comparable with asthma. The patients formed a well known type at the spas, being querulous and with their attention fixed in a morbid way on their abdomens. The treatment included stopping aperients, ordinary diet without coarse fibrous vegetables, and colonic lavage on alternate days with twenty to thirty ounces of isotonic saline solution under low pressure and at a temperature of not less than 102° F.; two douches were given at each session. After the first session or two large quantities of old mucus came away, and the general progress of the patients was striking. After the douche an immersion bath was given and a subaqueous douche to the abdomen. Other treatment included massage, exercise, psychotherapy, and the administration of bromides, belladonna, and full doses of the ammoniated tincture of valerian. The results were very good, but occasionally the treatment had to be repeated.

Professor L. S. Dudgeon mentioned the importance of taking swabs directly from the ulcers, and agreed with the views of Dr. Hurst as regards the bacteriology of ulcerative colitis. With the possible exception of the *B. mucosus capsulatus* and the haemolytic colon bacillus no bacteria were concerned, and he denied that streptococci could be incriminated. The prevalent therapeutic intestinal bacteriology reminded him forcibly of the practices of Chinese medicine. He had seen two cases of ulcerative colitis in which there was a very high blood agglutination titre for the Shiga bacillus, though there was no other evidence of such infection. He could not understand how the serum treatment could be effective.

Dr. J. A. Ryle had seen about ten patients treated with serum who had improved very much, but he agreed that it was difficult to explain the mechanism of this treatment.

BRONCHIECTASIS.

At a meeting of the Medical Society of London on November 22nd, the President, Sir Humphry Rolleston, in the chair, there was a discussion on recent advances in the diagnosis and treatment of bronchiectasis.

Dr. Clive Riviere, in opening, attributed the protean character of bronchiectasis to the many causative factors. It might attack many or few bronchi, and these might be large or small, unilateral or bilateral, while the surrounding lung might be healthy, inflamed, or fibroid. The dilated tubes might be healthy, catarrhal, or the seat of great suppuration. For severe cases with suppuration new methods of treatment were urgently required. The recent advances in diagnosis comprised the use of the bronchoscope and of bismuth or lipiodol injections to render the diseased portion of the lungs opaque to x rays. In a large number of cases treatment by postural drainage and by the creosote chamber was quite successful. Only when these methods failed should other means be employed. The easiest of these was bronchoscopic treatment: aspiration, lavage, and removal of obstructions, granulations or strictures, through the bronchoscope. If "bronchial drainage" failed altogether other more radical measures should be considered. These included improvement of drainage, closure of cavities by collapse or compression of the lung, and extirpation of the diseased area. Only a small proportion of cases of bronchiectasis were suitable for surgery. Dr. Riviere dealt first with pneumotomy, but external drainage by such means was only useful when a single cavity or a "bronchiectatic abscess" was present. In a few cases where the cavities were capable of collapsing, artificial pneumothorax should be considered, but it was usually of little use, especially as adhesions were extremely common. There was also the danger of producing a pyo-pneumothorax. Such treatment was best for developing post-pneumonic cases in early life. Phrenic evulsion was only of use in strictly basal cases, especially on the right side, but it was even then only palliative at the best. Dealing next with thoracoplasty, the speaker stated that the older paravertebral thoracoplasty had done little good in cases of bronchiectasis. Recently Hedblom had introduced a more complete basal operation with greater success. Dr. Riviere thought, however, that this was a very severe measure to gain in most cases only a palliative effect. Ligature of the pulmonary artery had been tried for bronchiectasis, but without good results. Lobectomy or "cautery lobectomy" was a method of removal of a lung or lobe of a lung. It had usually been associated with a very high mortality, but more recently Evarts Graham had urged the use of the cautery for lobectomy, whereby the diseased area was destroyed piecemeal with the actual cautery. During the process the diseased bronchi were cut through and massive drainage was thus obtained. At the end bronchial fistulae were left, but these as a rule closed spontaneously at a later date. Air embolism and haemorrhage were the main dangers encountered. Of thirty-one patients of Graham's series 55 per cent. were reported cured and 13 per cent. improved, while the

by the fundamental experiments of Lashley on learning-processes in rats. Among other experiments Lashley showed that rats would, after a certain number of trials, learn to press a pedal-board in order to open the door of their food-box. They would learn to do this even after removal of almost the whole of the cerebral cortex; but if the habit was acquired before removal of the cortex it was lost after the operation and had to be relearned. It appeared, therefore, that although the cortex played a part in the formation of new habits, its participation was not absolutely essential.

Professor Herrick addresses himself to the question of the function of the cortex in the light of these experiments. Setting aside the current methods of objective psychology, he proceeds on strictly biological lines, describing the gradually increasing complexity of cerebral mechanism, from the brains of fishes and amphibia upwards, and indicating its bearing on mental capacity. In the lower animals the greater part of the cortex is occupied by projection centres, each connected with some particular thalamic reflex apparatus—visual, somaesthetic, etc. Each centre is surrounded by a zone of associational fibres concerned with the correlation of the cortical centres. In an animal provided with a nervous mechanism of this kind, if the usual simple reflex resulting from stimulation does not result in a response adequate to the circumstances, nervous impulses pass over into the thalamus and cortex and a number of other behaviour-patterns are brought into play; if an adequate response should result from one of these, the re-activation of the corresponding behaviour-pattern is thereby facilitated and a habit is formed. This seems to be the nature of the learning-process in the rat. In higher brains the cortical associational zones are separated by secondary association centres, which are not dominated physiologically by any one system of projection fibres. With the elaboration of these centres, emancipated as they are from the domination of subcortical sensorimotor systems, a mechanism is available for the recombination of habitual behaviour-patterns in hitherto unexperienced ways; in other words, imagination becomes possible, and the animal acquires insight, not merely looking at a problem, but looking through it to the solution. Further, the associational centres are so organized that a similar structural change or cortical set may be preserved, even in those cases where a cortical association does not result in overt action; and reactivated cortical patterns (memories), knit in with the lower sensorimotor systems at the moment in action, serve as deciders of conduct.

In the rat the association centres are poorly represented and there is little evidence that the animal possesses anything in the nature of insight. In learning it has to trust to some behaviour-pattern chancing to be adequate to the occasion; it does not foresee the solution of the problem. That which is most characteristic of human cortical activity is a plasticity of organization which facilitates the formation of innumerable transient associational patterns which have no enduring quality. In advance of any overt act we think through many provisional solutions, discarding one after another until the right course is discovered. It is the capacity to do this that most sharply differentiates men from rats. Professor Herrick's work is an interesting piece of close reasoning.

MATERIA MEDICA FOR DENTISTS.

WE are impressed by the fact that a sixth edition of COLEMAN'S *Materia Medica for Dentists*,[6] which first appeared in 1914, has now been called for, and we take this as evidence of appreciation by a great number of students. Our opinion that students are collectively good judges of the merits of a textbook is confirmed by a perusal of the work. The descriptive notes on materials are neither unduly curtailed nor so much laboured as to make heavy reading, but are neatly expressive of the facts and adapted with good judgement to students' needs. Notes on pharmacology and therapeutics which are appended to the description of drugs and chemicals convey a clear account of their properties. The pertinent facts of physiology are also summarized in illustration of principles of treatment; and toxicological data are given in ample detail regarding those substances which in overdoses exert untoward effects. The book appears to contain all that is needed to equip the practising dentist with adequate knowledge of the materia medica that he may have occasion to use.

[6] *Materia Medica for Dentists.* By Frank Coleman, *M.C.*, L.R.C.P., M.R.C.S., L.D.S. Sixth edition. Oxford Medical Publications. London: Milford, Oxford University Press. 1926. (Cr. 8vo, pp. xvi+345. 10s. 6d. net.)

DISEASES OF THE PROSTATE.

IN his *Traité des Maladies de la Prostate*[7] Dr. GEORGES LUYS deals with the various diseases affecting the prostate and with modern methods of treatment. The author's name is particularly associated with direct-vision urethroscopy and cystoscopy, and with the treatment of enlargement of the prostate by means of diathermy; it is natural, therefore, that these subjects should take a prominent place in his book. Those who have departed from the routine practice of prostatectomy for all cases of enlargement and have advocated the use of less drastic methods in cases of minor enlargement have been subjected to considerable adverse criticism, and in the portion of his work devoted to the subject of *forage*, or removal of the obstructing portion of the prostate by means of diathermy applied through a posterior urethroscope, the author has dealt at length with the objections that have been brought against this method of treatment. Naturally he writes with the pen of an enthusiast, and it may be that his enthusiasm has carried him too far in the direction of advocating *forage* for some patients in whom total prostatectomy would be a more suitable operation. Unjust criticism is very apt to produce this reaction in those against whom the criticism is directed. However, although such a large portion of the book has been devoted to *forage*, the author has wisely obtained the collaboration of an exponent of total prostatectomy, and Dr. VICTOR PAUCHET has contributed the chapters on the surgical treatment of enlargement and of cancer. Dr. Pauchet is a partisan of the perineal route and, after describing the method employed by Young, deals with his own, which appears to be a combination of certain points from Young's and some other surgeons with that of Proust. This portion of the work has been very clearly written and, what is still more important, has been illustrated with such a profusion of diagrams that it is possible for the reader to follow each step in the perineal operation without even referring to the text.

In the section dealing with prostatitis, written by Dr. Luys, the author advocates the use of a Frank's dilator, and states that this instrument (which in England is known as a Kollmann's) exactly fits the posterior urethra and allows of its dilatation. In our opinion, however, no instrument has yet been constructed that is capable of bringing an equal pressure to bear on the walls of so complicated a cavity as that of the prostatic urethra; in the hands of the average surgeon any form of mechanical dilator may do more harm than good when used in the prostatic urethra. It may be said, therefore, that the most noteworthy features of Dr. Luys's book are an apologia for endoscopic methods of treatment, a full account of the technique employed by the author, and excellent chapters on perineal prostatectomy and the surgical treatment of cancer by Victor Pauchet. The book contains much that is peculiar to the author, and will not therefore meet with general favour, but at a time when medical books are turned out in great profusion without any particular reason for their appearance, originality is a welcome quality. In his preface the author states that he has gone to considerable pains to ensure that the book should be well illustrated, and he has succeeded. It is a pleasure to read a book in which surgical technique can be followed so clearly by reference to the diagrams. It is by skilful use of line drawings rather than of half-tones that the greatest assistance is given to the reader, and the text of *Traité des Maladies de la Prostate* is excellently served in this respect.

[7] *Traité des Maladies de la Prostate.* Par Georges Luys. Prostatectomies et Tumeurs Malignes, par Victor Pauchet. Paris: G. Doin. 1925. (6¾ × 9¼, pp. 680; 457 figures, 5 plates. 90 fr.)

Reviews.

DISEASES OF THE HEART.

The title *Facts on the Heart*[1] well expresses the contents of the book by Professor R. C. Cabot. The material round which it is written consists of 1,906 necropsies, covering all the cardio-vascular material in the 4,000 necropsies done at the Massachusetts General Hospital between the years 1896 and 1919; starting from the *post-mortem* diagnoses, the author has worked back to the clinical records. He modestly says that his own task has been the putting together and editing of material recorded by others, but it is essentially the editing which makes the book interesting and stimulating. It is not a textbook in the accepted sense of the word: the usual arrangement is departed from, the writings of the past are hardly referred to, and the whole text is a common-sense and realistic discussion and interpretation of the facts presented by various groups of cases during life and after death. The value of the book lies not so much in the new observations it contains as in its clear presentation of familiar material along modern lines. At the outset there is a statement to the effect that many terms used in discussing heart disease refer to imaginary conditions, and that we no longer need to consider and search for fatty degeneration, fatty overgrowth, brown atrophy, and myocarditis, or the senile heart. Clinical inquiry, the author remarks, is thus simplified and a correct diagnosis rendered easier; this promising start will perhaps dispose the reader to listen to what he has to say on other matters, and to withstand the shock of the question, "Does it exist?" with which the section on mitral regurgitation begins; the answer is that if it does it is extremely rare and that even then there are no physical signs by which it can be recognized, so that a diagnosis of mitral regurgitation without stenosis is never justified. Similarly a diagnosis of myocarditis is held never to be justified as a statement of the main cause of death, unless verified by necropsy. These opinions are not entirely new, but they are expressed with cogency and emphasis and will doubtless command attention. The cardiac condition most commonly recorded in this series is enlargement without valvular lesions, and the cause, though not established in all cases, is thought most probably to be hypertension, however produced. An interesting point made is that when once syphilitic aortitis becomes known it kills in most cases within two years from the first symptom—a prognosis of graver import than would be given in this country. While the discussions on the whole are concise and to the point, the numerous detailed clinical and *post-mortem* records tend to make tedious reading, especially with their "question and answer" additions: straightforward statements might have served the purpose equally well. The book offers much that is of interest and will fully repay careful digestion; it is clearly printed and contains numerous statistical tables; the various lesions are illustrated by photographs.

With Dr. G. F. Laidlaw's translation of a book by Professor Henri Vaquez, published under the title of *Diseases of the Heart*,[2] there is added yet another to the list of orthodox textbooks on this subject in the English language. It is a large book of over seven hundred closely printed pages, and is an excellent statement of French views from the days of Laennec and Potain to the present time. A detailed review of such a book is unnecessary; the main outlines of its arrangement and material do not differ from those of its predecessors. It is in this light perhaps that the volume is disappointing, for while the observations of recent workers in our own and other countries are freely referred to, yet there is little evidence that the spirit of dissatisfaction with traditional views expressed in these observations has to any considerable extent influenced the beliefs of the author. Thus, though in speaking of auscultation it is remarked that the difficulty is still at the point where Potain left it—namely, to distinguish organic from extra-cardiac murmurs—yet in the chapter on mitral insufficiency there is no reference to the views of those who hold that it is doubtful whether such a clinical entity exists and that it is rarely if ever that such a diagnosis is justified. Again, the major syndromes of heart failure are considered under the headings of failure of the left ventricle, failure of the auricles, and failure of the right heart. On the other hand, in another place there is a good discussion on the causes of heart failure, and throughout the book the clinical pictures are faithfully presented. The closing chapters are devoted to the treatment of heart disease in general. It is of interest in this connexion to note that the author is of opinion that quinidine may be tried even in the presence of heart failure by taking the precaution to give a preliminary course of ouabaine or digitalis. Lists of references are given at the close of the principal chapters, and there is a good index.

The *Manuel de Cardiologie Pratique*[3] by Professor Schrumph-Pierron of the medical clinic of the Kasr-el-Aini Hospital at Cairo is a complementary volume to his *Diagnostic Cardiologique*, published about five years ago. In it he addressed more particularly the cardiologist who was interested in the newer graphic methods; the present handbook is prepared specially for students and practitioners, and in consequence has a more immediately practical bearing. The presentation of the subject in general follows stereotyped lines. After chapters dealing with anatomy, physiology, and physics of the circulatory apparatus the different methods of examination are explained in detail, more attention being paid to physical methods than to graphic records. In discussing diseases of the heart too much stress is laid on valvular lesions as such, and in many cases no mention is made of etiological factors in connexion with them. A special chapter is, however, devoted to syphilis, and some useful figures are presented. Thus of 417 cases of visceral syphilis in a series of 4,280 patients, 60 per cent. had cardio-vascular lesions, and of 992 patients in the same series who had cardio-vascular disease, 46.7 per cent. had syphilis of the heart or aorta. Angina pectoris and diseases of the blood vessels are also dealt with, and treatment is discussed in the closing chapter. The book will no doubt serve a useful purpose, and it gives the author's views in the lucid style characteristic of the best French writings. We do not, however, observe any outstanding merit which would make it likely to displace books on the same subject in our own language.

The second edition of *Modern Methods in the Diagnosis and Treatment of Heart Disease*,[4] by Dr. F. Heatherley, has been increased in size, and the price has risen from 5s. to 8s. 6d. The author has added a chapter on infections, and one on blood pressure, largely derived from the results of French investigations. The appendix includes a form of instructions which has been found very useful at the Manchester heart clinic in securing the intelligent co-operation of patients suffering from functional disorders of the heart. This form of instructions has now been published separately as a pamphlet, which may be obtained from the publishers at the price of 3s. 4d. a dozen.

BRAINS OF RATS AND MEN.

Professor C. J. Herrick's book entitled *Brains of Rats and Men*[5] deals with the subject of the mechanism of control of animal behaviour and the light thrown upon it

[1] *Facts on the Heart.* By Richard C. Cabot, M.D. Philadelphia and London: W. B. Saunders Company. 1926. (Roy. 8vo, pp. 781; 163 figures. 35s. net.)

[2] *Diseases of the Heart.* By Dr. Henri Vaquez. Translated and edited by George F. Laidlaw, M.D. Introduction by William S. Thayer, M.D. F.R.C.P.Hon. Philadelphia and London: W. B. Saunders Company. 1925. (Roy. 8vo, pp. 743; 146 figures. 42s. net.)

[3] *Manuel de Cardiologie Pratique.* Par Professeur P. Schrumph-Pierron, Cairo. Paris: N. Maloine. 1925. (7 × 8½, pp. vii + 333; 67 figures, 1 plate. 28 fr.)

[4] *Modern Methods in the Diagnosis and Treatment of Heart Disease.* By Francis Heatherley, M.B., B.S.Lond., F.R.C.S. Second edition. London: Baillière, Tindall and Cox. 1925. (Extra post 8vo, pp. xii+269. 8s 6d. net.)

[5] *Brains of Rats and Men.* By C. Judson Herrick, Professor of Neurology, University of Chicago. Chicago: University of Chicago Press; London: Cambridge University Press. 1926. (Post 8vo, pp. xiii + 332; 53 figures. 15s. net.)

The President, after paying a tribute to the memory of Sir Henry Morris and expressing gratitude for the work he did for the Fund, said it was an experience common to all charitable institutions at the present time that the amount received from legacies and donations was declining, no doubt on account of the increased cost of living, continued pressure of taxation, and the very heavy death duties—a combination which left people but little margin to give for even such subjects so important to mankind as cancer research. A satisfactory point disclosed by examining the statement of receipts and expenditure was that the office expenses, including salaries, printing, stationery, and advertisements, worked out at less than 7 per cent. of the total expenditure. On behalf of the vice-presidents and other members of the General Committee, he expressed to the chairman and members of the Executive Committee, the subcommittees, and the honorary treasurer (Sir George Makins) their appreciation of their honorary services in the cause of the Fund.

A vote of thanks to the President was adopted on the motion of Sir John Rose Bradford, P.R.C.P.

THE SCHOOL OF HYGIENE AND PUBLIC HEALTH OF THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, U.S.A.

(*Concluded from page 959.*)

In our last issue we reported the opening of the new buildings of the School of Hygiene and Public Health at Baltimore, and gave an account of its general character, with a picture of the elevation. We now give an account of its departments and the manner in which they are housed; for the information on which it is founded we are indebted to Dr. Andrew Balfour, director of the London School of Hygiene and Tropical Medicine. We mentioned last week that Dr. Balfour, whose address at the opening ceremony was published in the British Medical Journal of October 30th, received the honorary degree of LL.D. from Johns Hopkins University. Dr. Balfour, on his way back, delivered an address at the scientific medical conference held at the University of Rochester, New York, on October 26th, and received from that university the honorary degree of D.Sc.

The general plan was to give a separate floor to each department and to place the administrative offices and the rooms for general purposes in the first floor and basement. This was the scheme which it was intended to carry out in the London school, but unfortunately it could not be realized in its entirety. Even at the Baltimore school there is an exception, for the department of public health administration shares the second floor with the department of epidemiology.

A special feature of the building is the arrangement for animal quarters. A separate elevator and a service stairway are provided so that animals, food, and supplies can be brought to each department without entering the main building. The animal quarters are built vertically in such a way that each department has access to its animals on its own floor. The animal rooms, while continuous externally with the rest of the wing, are separated internally by a wide air-shaft provided with double doors and a ventilating fan. Special extra provision has been made for a rat colony in the department of chemical hygiene. It is interesting to note that in the plans for the London school a somewhat similar provision has been made in the biochemical department of the chemical division. With this exception the quarters for the experimental animals have, in the case of the London school, been placed upon the roof, occupying two recessed floors, the fourth and fifth.

More reliance is placed on artificial ventilation in the Baltimore than in the London school, where, with the exception of the large lecture theatre, natural ventilation is the rule. To some extent this is no doubt explained in terms of the different shape of the two buildings. The school at Baltimore has some other features not seen in the London building—as, for example, a large kitchen and serving and dining rooms in the basement; it has the advantage over the London school of drawing its steam heating and water supplies from a central plant. Hence there has been no need to provide boilers and furnaces in the basement, and much space has thereby been saved.

On the first floor the administrative offices, together with a rest room, locker room, and toilet for women students, occupy the front of the building. In the central wing, on the eastern side, is the main auditorium, with seats for 310. The north wing contains the general library and the librarian's office, while a similar room in the south wing, originally intended for a museum, is at present used as a lounge and reading room for students. This floor is connected with the basement and the upper stories by two fire-proof stairways and two passenger elevators. The first floor answers to the ground floor of the London school, and has much in common with it so far as the general lay-out goes, for in both are the administrative offices, student rooms, and a large lecture theatre. Here, however, the resemblance ceases, for in London the division of sanitary science and public health administration occupies this part of the school building, which contains also laboratories for the director, for sanitary engineering, and for tropical hygiene and pathology. In the London building the library, a very large and handsome room, runs nearly the whole length of the front on the first floor. It is a much more important feature than the library in the Johns Hopkins School, where, however, the arrangement is temporary, as there is a scheme to concentrate all the library facilities of the medical centre in a building adjacent to the school of hygiene.

Public Health Administration and Epidemiology.

The second floor at Baltimore is shared by the department of public health administration and that of epidemiology. The former does not require elaborate or special equipment, and accordingly the rooms assigned are, for the most part, offices and classrooms. The same is true of the corresponding division in the London school. At Baltimore certain rooms along the west front are occupied by the office of administrative information of the United States Public Health Service, and a somewhat similar arrangement holds good at the London school, where, on the first floor, a series of rooms is allotted to the Bureau of Hygiene and Tropical Diseases, at present an activity of the Colonial Office under the direction of Dr. A. G. Bagshawe. At Baltimore a room of the second floor is assigned to the local office of Shellfish Sanitation of the Public Health Service. Of the remaining rooms in this department mention may be made of that used for the preparation of the large amount of mimeographed material employed for teaching purposes, the seminar room for advanced classes, and the workroom for special students. Much of the teaching of this department is carried on by field demonstrations and conferences.

The department of epidemiology, which also requires no elaborate arrangements for its intramural work, occupies a little more than half of the floor and shares a lecture room and seminar room with the department of public health administration. In addition to general office rooms and a departmental library, there is a room for mimeograph work and the filing of records, a storeroom and a dark-room for photographic work, which, however, is at present done by commercial photographers. In the south-west wing is the general students' laboratory, a large, well lighted and well ventilated room equipped for a class of at least forty. Each student has his own work table, and is supplied with a ten-inch slide rule to assist him in his calculations. There is a laboratory for special students, where Monroe calculating machines and a drafting table are available. A seminar room permits of informal conferences with small groups of students.

At the London school, where the teaching of epidemiology is combined with instruction in vital statistics, the special provision, though not so extensive as at Baltimore, is on very similar lines, but both at London and Baltimore it is recognized that epidemiology, properly defined in a broad sense, is a science much too comprehensive to be taught in any single department of the school. Hence, in that bearing its name, the consideration will be limited to certain aspects of the subject, some of which are best studied in the field.

Biometry and Vital Statistics.

The department of biometry and vital statistics fills the whole of the third floor, and it would seem that the large amount of space at its disposal is somewhat disproportionate, considering, for example, that the large department of medical zoology, embracing a number of highly important subjects, possesses similar accommodation, if we exclude the section of filterable viruses, which does not really belong to it. The strong position

NOTES ON BOOKS.

In volume vi of Mellor's *Comprehensive Treatise on Inorganic and Theoretical Chemistry*[8] the subject of carbon is continued, the sections dealing with carbon dioxide, carbon sulphides, and related matters bringing the chapter to a conclusion. The cyanides are not touched on, academic authority having decreed that these belong to the subject of organic chemistry; a note by the author, however, conveys a hint that they may be discussed in a supplementary volume. The subject of silicon follows carbon in order of treatment here, as does the element in order of periodicity. It is concerned with a vast number of minerals and compounded silicates; though many of them possess only isolated points of interest, the pages present a wealth of information to the mineralogist, and there is much readable matter under the headings of the better known substances, such as talc and meerschaum. The latter, we are told, is used as a building stone in Spain and as a soap in the Moorish baths of Algeria. Ceramics, glass, hydraulic cement, and materials used in the arts furnish so much matter for discussion that nearly seven-eighths of the whole volume are devoted to the chemistry of silicon. The compilation has been done in the same satisfying manner that we have had occasion to eulogize in noticing preceding volumes of this edition.

If the dead languages are as dead in America as some people would like to make them in this country, then Mr. Arthur L. Tatum's little book *Prescription Notes*[9] is justified. For he tells the student how to write a prescription, the meaning of the Latin terms used, how *recipe* governs the accusative, that a portion of a drug is in the genitive case, and that orders to the pharmacist are given in the subjunctive mood. But directions for the patient must be written in English, says Mr. Tatum, so the cochlear of Celsus appears nowhere in the glossary. For the rest the student is given a few general rules about incompatibility, some weights and measures, the dosage of the more important drugs in the *United States Pharmacopoeia*, and many blank pages for recording prescriptions. "Verbatum" is, we presume, a misprint for the word coined from the dead language Mr. Tatum teaches.

Folia Japonica Pharmacologica[10] is a new journal containing papers on pharmacology from the Japanese laboratories. Most of them are in Japanese, and only a minority are in European languages, but summaries in German or English are given of the Japanese papers. Two volumes of about 400 pages have appeared during the past year—a fact which bears testimony to the activity with which research is being prosecuted in Japan. The papers are on a great variety of subjects, but a large proportion deal with the analysis of the action of drugs by the study of their effects upon isolated organs.

Following the practice of their previous edition of the animal parasites of man,[11] Braun and Seifert have divided what would have been an extremely heavy and cumbersome volume into two parts. The first or zoological part is by Dr. Max Braun, and has already been noticed in these columns (British Medical Journal, November 14th, 1925, p. 909); the second or clinical part is by Dr. Otto Seifert, and has just been published. It is a volume of 600 pages devoted entirely to a consideration of the clinical and therapeutical aspects of protozoology, helminthology, and entomology—eloquent testimony to the advance in our knowledge of the animal causes of disease. This volume has been considerably revised since the previous edition in 1920, but the new matter is mainly of German origin; the account of foreign work is sketchy and often incomplete. Some new chapters have been added; others have been considerably revised. The illustrations are few in number, and on the whole poor in quality. It is unfortunate that a volume which occupies such an important position in the standard literature of tropical medicine should not be better provided with clear and adequate drawings and photographs. In spite of these defects, Dr. Seifert still maintains the high standard of usefulness and the comprehensive encyclopaedic character of his book, and renders available for those who read German a useful synopsis and compendium of such diseases of man as are caused by animal parasites both in tropical and temperate countries.

[8] *A Comprehensive Treatise on Inorganic and Theoretical Chemistry*, Vol. vi. By J. W. Mellor, D.Sc. London and New York: Longmans, Green and Co., Ltd. (Roy. 8vo, pp. x + 1024; 203 figures. £3 3s. net.)

[9] *Prescription Notes*. By Arthur L. Tatum. Chicago, Illinois: University of Chicago Press; London: Cambridge University Press. 1926. (Pott 8vo, pp. 22, and many blank pages. 6s. 3d. net.)

[10] *Folia Japonica Pharmacologica*. Vol. I; Vol. II, Fasc. I, II, and III. Kioto Imperial University: Pharmacological Institute.

[11] *Die Tierischen Parasiten des Menschen*. Bearbeitet von Dr. Max Braun und Dr. Otto Seifert. Zweite Teil: Klinik und Therapie der Tierischen Parasiten des Menschen. Von Dr. Otto Seifert. Dritte Auflage. Leipzig: C. Kabitzsch. 1926. (Sup. roy. 8vo, pp. vi + 574; 21 figures. M.27; bound, M.29.40.)

IMPERIAL CANCER RESEARCH FUND.

At a meeting of the General Committee of the Imperial Cancer Research Fund held on November 23rd, with the Duke of Bedford, President, in the chair, Sir Humphry Rolleston, Bt., chairman of the Executive Committee, in moving the adoption of the annual report, including that of the director, Dr. J. A. Murray, said nothing was more striking than the way in which progress in scientific work was characterized by a series of successive periods of great activity, with periods of relative quiescence between. Each period of activity was started by some salient discovery or fruitful conception, the working out of which engaged for a longer or shorter time the energies of those employed in that field. He instanced the application of the spectroscope to stellar astronomy by Huggins, the discovery of radio-activity, and, in the biological sciences, the rediscovery of Mendel's laws of heredity and also insect transmission of tropical protozoan diseases, the bacteriophage, and the discovery of hormones. The same might be said of the era opened up by Ehrlich's brilliant achievements in chemotherapeutics, and the isolation of insulin still more recently had started the wave of activity in the study of the physiology of carbohydrate metabolism and the therapeutics of diabetes which was in full career at the present time. Cancer research exhibited the same phenomenon in a striking manner. The first period was that following the discovery by Jensen and Borrel of the transplantability of the malignant growths of the mouse. Although there was a tendency for the achievements of that period to be overshadowed by more recent work, it should be recognized that the insight into the properties of cancer cells which was owed to Jensen and his successors had given a precision to conceptions of the cancer process as essentially a cell problem which dominated the attitude to all attempts to elucidate its causation to the present day. The work of this first period dealt with the cancer cell already fully developed and the attempts at explanation based on it of the etiology of the disease were in the nature of inferences, more or less happy. In the second period the interest shifted to the study of the conditions under which cancer arose in the individual primarily attacked. The work of Fibiger, Yamagiwa and Ichikawa, and Tsutsui gave the primary impetus to an enormous amount of work, which still continued, on the actual production of cancer anew, starting with normal animals. The part played by chronic irritation in the causation of cancer, the relation of the duration and intensity of the irritation to the time necessary for the effects to be produced, and the mutual reinforcement which different agencies give to each other, had put a rational, sequential facies on many of the features of the natural history of cancer which, till these investigations had been carried out, still appeared mysterious and capricious. Much remained to be done along these lines, and work proceeded in the laboratories of the Fund in continuation of the investigations mentioned in last year's report. If the interest and activity aroused were taken as an indication, the work of Gye and Barnard on cancer causation by ultramicroscopic microbes, published eighteen months ago, could be regarded as starting still a third period in cancer research. A number of papers had appeared in Europe and America, and, as was to be expected, agreement had not yet been reached. Both the facts and their interpretation were in dispute, and in these circumstances it was necessary to exercise patience and continue the investigations. Of the various lines of work bearing on the validity of Gye's conception at present in progress in the Fund's laboratories, that of Dr. Begg was furthest advanced. His results confirmed the existence of two factors, as advanced by Gye, in the successful transmission of these tumours.

Sir Anthony Bowlby, Bt., seconded the motion to adopt the annual report, and this was carried unanimously.

Sir Humphry Rolleston then moved that an annual general meeting be not held in future, with the understanding that the General Committee would be summoned to meet when there was business to transact, and that the annual report would be issued to the General Committee and to subscribers as heretofore. This was seconded by Sir Frederick Andrewes and carried.

It will be seen that this great building has been very carefully designed. It is well built, attractive in its lay-out, pleasant as a working place, and admirably adapted to the purposes which it has to serve. The Johns Hopkins University is to be heartily congratulated on this accession to its research and teaching resources, and all interested in public health development in the United States and elsewhere will wish the School of Hygiene and Public Health at Baltimore a continuance and enhancement of the success it has already achieved.

RACIAL DECADENCE.

DAVID LLOYD ROBERTS LECTURE BY THE DEAN OF ST. PAUL'S.

BEFORE the Royal College of Physicians on November 19th, Sir JOHN ROSE BRADFORD presiding, the Very Rev. W. R. INGE, D.D., Dean of St. Paul's, delivered the David Lloyd Roberts Lecture, taking for his subject racial degeneration.

Dean Inge began by remarking that eugenics was a branch of science in which he had been keenly interested for many years, ever since he was a near neighbour of Sir Francis Galton in Rutland Gate, and learned from that fine old man to feel some of his own enthusiasm about the possible improvement of the human stock. For him (the Dean) it had been, of course, a hobby rather than a rigorous study, and he could not suppose that any utterance of his on this abstruse and difficult subject would have any value as a contribution to knowledge. It would deal rather with the borderland between strict science and practical social hygiene. Politics ought to be a branch of social hygiene, though at present social hygiene was hardly even a branch of politics; but the subject of racial decadence was one of supreme public interest, and he wished he were better equipped with technical knowledge to state the problem.

He had taken the negative side of eugenics rather than the positive—racial degeneration rather than racial improvement—not because he had any natural tendency to dwell on the dark side of the changes which were proceeding in the human race, but because at present negative eugenics was far more important than positive. Natural selection in a humane and highly specialized country like our own had almost ceased to operate, and if some rational substitute were not provided for it, Nature would punish us for interfering with her methods of social hygiene without providing anything to take their place.

The Effects of Specialization.

All science was based on the belief that in natural laws there was neither variableness nor shadow of turning. Biological progress meant increasing complexity of structure and function, increasing specialization and co-operation of parts, but what was called human progress was more than this. Specialization always meant limitation in some direction (fortunately there were physiological limits to specialization itself); we could not, for example, have both wings and arms until we became angels, and if our limbs were good for running we could not swim like a fish. Highly differentiated organisms were fit only for certain conditions, and when those conditions were changed the organism must either perish or return to a less differentiated type. It was only the least differentiated organisms like the germ cells which were potentially immortal.

In the human species there had been three stages of evolution: increasing complexity of bodily structure, increasing intelligence, and increasing social organization. It was broadly true that when a new stage began the evolution of the earlier stage became less active. To judge from other living organisms on the earth, stability seemed to be the rule, change the exception. It was probable that the four ice ages, divided by long interglacial periods, had had a great deal to do with the evolution of humanity. Perhaps Nature had expended nearly all her ingenuity. There had been no new classes since the appearance of mammals and birds in very early times. Even social evolution seemed to have come to an end. State socialism could no further go than towards a "Socialist Utopia governed and run by maiden aunts." Man had been a distinct species for probably more than a million years, but anything like specialization was a matter of the last ten thousand years or so, and this was a very short time for him to adapt himself to revolutionary changes in his habits. It was not to be wondered at that disharmony, bodily as well as mental, existed to plague us in our health and conduct. He supposed pathology was mainly concerned with such disharmonies, and it was instructive to notice how small a part disease played in the lives of wild animals, which were better adjusted to their environment.

Degenerative Changes in Human Structure.

It was sometimes said that evolution was rapid to start with, when some climatic or other change set it going, and then it came to a stop; but it seemed possible that physical changes were going on in our bodily structure as rapidly as ever, though, unfortunately, they seemed to be degenerative. It had been pointed out that the foot was altering, the little toe decreasing and the big toe increasing in size, the teeth were decreasing in size and strength, baldness in middle life was perhaps increasing, and something seemed to be happening to that apparently useless organ the appendix. He could not help thinking that eyesight had deteriorated rapidly. Very few middle-aged men could read a closely written or printed mediaeval book without glasses, though the ancient Greeks went on reading and writing without mechanical assistance till extreme old age. Nearly all the aptitudes which distinguished the handy man from the simpleton were now becoming superfluous. We might some day have a generation which could neither walk nor write, relying on the car in the one case and the typewriter in the other. Nature would leave us just enough intelligence to "press the button."

Had human intelligence advanced during the last five thousand years? It seemed very doubtful. Look at the ancient Egyptians living in large and well ordered communities, with all the facilities of a complex civilization. He would not go so far as Sir Francis Galton in estimating the comparative intelligence of the ancient Athenians, but there could be little doubt that the Greek was our superior. Civilization was mainly the result of accumulated knowledge and experience; each generation stood on the shoulders of the last, and had the chance of climbing higher from that point. Most of our acquisitions were in the custody of very few persons. Some of them were trade secrets, others could be mastered only by long years of application, and this explained why the arts and structure of civilization had occasionally disappeared. Some calamity might break the tradition. In medicine Celsus and Galen were far in advance of the superstitious and ignorant practice of the Middle Ages. It was unlikely, but not inconceivable, that such a disaster might occur again. There was a contemporary example in Russia, which, when it recovered, would have to go to Germany and other countries for the arts and sciences which had been almost extinguished at home.

An Industrialized Civilization.

Analogy suggested that where the weight of sustaining civilization was thrown upon tradition other faculties by which man slowly raised himself from savagery were likely to become partially atrophied. Whether such atrophy could be inherited was a vexed question into which he, an outsider, would be wise not to enter. It could not be disputed that those qualities which were once essential to progress had no longer the same survival value under civilization of the modern type. An industrialized civilization skimmed off the cream in each generation and then threw much of it away. In some societies a highly cultivated minority had flourished and produced achievements which were the wonder of posterity, but the remainder of the population were still quite uncivilized and uncared for. There had been biologists who accepted this type of State as the best. Benjamin Kidd also thought that cut-throat competition resulted from deep-seated physiological causes, the operation of which was inescapable. But unlimited competition exhausted the competitors, and, whether voluntarily or involuntarily, sterilized them. So severe was competition in the United States that 1,750,000 policy-holders of insurance companies gave an average life of 46 years for males and 52 for females. But in all the higher faculties

of biometry and vital statistics at Baltimore is doubtless traceable to the influence of Dr. Raymond Pearl, formerly the director of this department and now head of the Institute of Biological Research, with which his old department is in close association.

The department has a general lecture room, a general student laboratory with its seminar room, staff offices, the graduate student library, the departmental library, the general laboratory rooms, and storage rooms. The department is specially well equipped, containing a complete Hollerith outfit for analysing statistical data by the use of punched cards, a drafting and photographic section with a photostat machine for duplicating work, and a supply of drawing instruments, together with planimeter and integraph. Practically all types of modern computing and adding machines are in use in the department, and each student has a computing machine.

One room is fitted up as a probability laboratory and contains a sampling machine designed and built by the department. The departmental library is a special feature, for it collects and stores the raw data in the field of vital statistics. At the London school good provision has been made for the study of vital statistics, at least by the ordinary D.P.H. student. With facilities available at the Galton Laboratories of University College there was no need to have such a large and elaborate department as the Johns Hopkins school can boast.

Medical Zoology.

The fourth floor at Baltimore corresponds to the third floor of the London school, for it houses the department of medical zoology, including protozoology, helminthology, and medical entomology. A large room consisting of four units is used as a lecture room and laboratory for courses in these subjects and in parasitology and filterable viruses; it is used also for the weekly meetings of the Research Club in Medical Zoology and for various special meetings. A two-unit room adjoining the students' laboratory serves as a students' reading room, and also for seminary meetings and also for the weekly luncheons of the department; in it are the Samuel Taylor Darling Library and the departmental library. A number of other rooms for general use by both students and investigators include a refrigerator room, a centrifuge room, and rooms for instruments, glassware, chemicals, and technical assistants.

A group of seven rooms is provided for protozoology, and a similar group of eight rooms for helminthology; there are three rooms for medical entomology, and one for filterable viruses. A large three-unit room is used for students carrying on special work in medical zoology. This division of the floor space enables the students of each subject to maintain constant relations with each other, and supplies a common meeting place in the seminary room, students' laboratory, and general supply rooms.

There is a general resemblance to the arrangements at the London school, where, however, the general students' laboratory is much larger, as all the students studying tropical medicine have to be accommodated, and provision is being made for an insectarium and an aquarium.

Bacteriology.

The department of bacteriology, which is on the fifth floor at Baltimore, has been organized along somewhat special lines. A large media preparation division has been established; though expensive to run, it saves both time and effort on the part of instructors and students. There is a teaching laboratory easily accommodating forty students, and in it courses in what are called sanitary bacteriology and public health bacteriology are given. The former embraces the bacteriological examination of air, soil, water, sewage, milk and other foods, while the latter is concerned with the study and identification of the pathogenic organisms responsible for disease in man and the differentiation of the pathogenic bacteria producing disease in man and animals from similar organisms which play no such part. A smaller laboratory is devoted to work on food bacteriology and spirochaetology, and graduate students have a room to themselves. There is also a small laboratory for the chemical work which is necessary, from time to time, in any bacteriological department. There are rooms in addition for single workers and for two workers, and a seminary or lecture room, shared with the department of immunology.

Immunology.

The importance now attributed to the study of immunology is shown by the fact that the sixth floor is devoted to the department bearing that name. Its needs have been met by the provision of a laboratory for general class work, quarters for special and advanced students, private laboratories for members of the staff, a centrally placed preparation unit, and quarters for rather a large number of laboratory animals, because the nature of the class work necessitates the use of a number of animals by each student.

At the London school bacteriology and immunology form one division. It is well housed, but cannot be given such a large amount of space as is available for the two departments in Baltimore. In London it would not be possible for each student to carry out the immunization work with animals which is found so useful in the training at Baltimore.

Physiological Hygiene.

On the seventh floor is the important department where is studied the application of physiology both to personal and public hygiene. In addition to research and general laboratories and a dark-room for photometric and visual experiments, there is a lecture room accommodating seventy-five students so planned that it can be utilized for experimental and demonstrational exercises in two special directions. Lighting fixtures permit a study of the relative efficiencies of different methods of illumination, while communication by appropriate inlets and outlets with an elaborate air-conditioning plant in an adjoining room enables observations to be made upon the classes of different combinations of temperature, humidity, and movement in the air supplied to the lecture room. This is certainly a novel and presumably also an effective method of impressing upon the students the lessons it is desired to inculcate. The air-conditioning plant is also connected with a special cork-lined experimental room fitted with double windows, a refrigerator door, and ventilating fans. Here the physiological effects of change in atmospheric conditions upon man and animals can be studied. Each member of the staff is provided with an office and a private laboratory, and other rooms are equipped for research work by advanced students. The large laboratory for class work accommodates fifty students.

In the case of the London school it was originally intended to give physiological hygiene a floor to itself, but considerations of cost rendered this impossible, and it now occupies a large part of the first floor. Its general laboratory in size and position compares not unfavourably with that in Baltimore, and, speaking generally, it presents many of the same features. The *x*-ray section and air-conditioning room had to be placed in the basement, and it is at least doubtful whether the London school can afford to install an air-conditioning plant of the type in use at Baltimore. The question of lighting fixtures for comparing different schemes of illumination has not been considered in connexion with the plans for the London school, and it is doubtful whether the cost would be justified.

Chemical Hygiene.

In the department of chemical hygiene, which is on the eighth floor, five courses are given:

1. Analysis of food and water, the detection of adulterants, and the exercise of Government control over food products.
2. Analysis of blood, urine, and tissues, designed to familiarize students with methods used in the study of metabolism.
3. Metabolism and diet, covering the more important researches in the field of nutrition.
4. Technique of animal experimentation, designed to meet a demand for workers equipped to enter the field of research in nutrition.
5. Sanitary production and handling of food. During the course industrial plants are visited.

The department has a large student laboratory and fifteen rooms, four equipped as private offices, ten for chemical work, and one for histological study. Eight of these are private laboratories, and each has a shower bath as an emergency in case any student sets his or her clothing alight. One has already rendered timely service in such a case. On this floor also are provided a polariscope and a photographic and a constant temperature room. At the London school the division of chemistry with the department of biochemistry will occupy part of the second floor, which it shares with the division of bacteriology and immunology. It is not so large as the department at Baltimore, but resembles the latter in having a large animal room set apart for biochemical work.

Filterable Viruses.

A small floor up in the roof houses the department of filterable viruses, which is at present part of the department of medical zoology, but will doubtless before long become an independent unit. The study and laboratory of the head of the department are on the fourth floor, but on the ninth there are two research rooms, a room serving as a secretarial office both for the department and for the *American Journal of Hygiene*, which is here edited, and a room for animals. There are also facilities for photographic work.

British Medical Journal.

SATURDAY, NOVEMBER 27TH, 1926.

THE UNIVERSITY OF LONDON: A NEW PHASE.

DURING the past few weeks two incidents of great importance have occurred in connexion with the University of London. It will be remembered that in 1920 the Government purchased a site of eleven acres to the north of the British Museum, and offered it to the University on certain conditions. One of these conditions postulated the removal of King's College to a portion of the site. After prolonged negotiations between the University, the Treasury, and King's College, King's College determined, at the end of 1925, not to remove itself to the Bloomsbury site. Under these conditions it was impossible for the University to accept the site on the terms on which it had been offered. Although communications were made to the Government with the object of having the site conveyed to the University so that it might be utilized for various University purposes, the Government, in view of the inability of the University to accept the site on the conditions under which it was offered, invited the Duke of Bedford, in accordance with the terms of the original sale, to take it back at the price at which it had been purchased—namely, £425,000. The Duke of Bedford accepted this offer for repurchase, and consequently for the time being the site, as a whole, was lost to the University.

Recently, however, the Chancellor of the Exchequer indicated that he would be prepared to give a certain capital sum to the University, part of which should be used for the purchase of a portion, or as much as possible, of the Bloomsbury site. The Senate, at its meeting on October 20th, decided to enter upon negotiations with the Bedford Estate for the purchase of the blocks of land on either side of the British Museum Avenue between Keppel Street and Montague Place. These negotiations are now proceeding, and, we trust, will come to a successful termination.

The exact University purposes for which this land will be utilized have not yet been settled. The main principle, however, decided by the Senate is that the central administrative offices should remain at South Kensington in the buildings known as the Imperial Institute. The University institutions which it is considered possible may be placed on the land which is acquired at Bloomsbury are the Institute of Historical Research, the School of Oriental Studies, the Architectural Atelier, the Students' Union, the General University Library, the headquarters of the University contingent of the Officers' Training Corps, and so on. It will not be forgotten that on a site immediately adjacent to that indicated above the building of the London School of Hygiene and Tropical Medicine is being erected. We have also heard it suggested that if arrangements can be made Birkbeck College is very desirous of acquiring a portion of the Bloomsbury site. As is well known, the buildings and accommodation of Birkbeck College are extremely cramped, and from their position cannot be readily enlarged so as to meet present requirements.

If the negotiations of the University are successful, and it acquires those portions of the Bloomsbury site which it desires, there is no doubt that an important movement towards the establishment of a University centre in London will have been brought about.

The second point of importance is the fact that the University of London Bill passed its second reading in the House of Commons on November 19th, and that the money resolution required for the bill was agreed to in Committee. The bill, which has already passed through the House of Lords, was introduced in the Commons by the President of the Board of Education, Lord Eustace Percy. He stated that the object of the bill was to appoint statutory commissioners to draw up statutes for the University of London in general accordance with the report of the Departmental Committee, issued in March, 1926. He said that the bill, in the main, followed the lines of the measures which had already been introduced for the Universities of Oxford and Cambridge. If reference is made to our analysis of the report of the Departmental Committee in the JOURNAL of May 22nd, 1926 (p. 875), it will be seen that the chief recommendations of that committee consisted of two things. First, to modify the present constitution of the Senate so as to give representation on it to the constituent schools of the University. At the present time the only constituent schools which have direct representation on the Senate are King's College and University College. Secondly, the departmental committee proposed the establishment of a Finance Council to deal with all questions of finance. It is not recommended in the bill that the Commissioners should alter the representation of the faculties or the body of graduates on the Senate. It does, however, entail a reduction by the removal from the Senate of certain nominated members, such as those who in the past have been appointed by the Royal College of Physicians, the Royal College of Surgeons, the Incorporated Law Society, and the Inns of Court. The reason the Departmental Committee gave for the elimination of these nominated senators was that they could not get any proper organic representation of the schools of the University without eliminating some of the present members. Lord Eustace Percy stated that it was not proposed to interfere with the rights of either theological colleges or external students. Dr. Little, in moving the rejection of the bill, based himself on the lines of the now defunct Haldane report. The arguments he used, however, were mainly in favour of reform coming from within, and of ensuring that there should be no interference with the supreme authority of the Senate in all matters financial and academic. These arguments, however, did not convince the House of Commons, and the bill was read a second time without a division.

Most of those who have had experience of the detailed working of the University, especially as regards its administration, entertain no doubt that the establishment of a new Finance Council and the modification of the constitution of the Senate on the lines proposed will tend in the future to great improvements in all branches of University work in London.

As regards the work of the Finance Council, it is proposed that the Government grant of about £360,000 (at present given through and allocated by the Universities Grants Committee) and the grant from the London County Council of £70,000 shall be paid to the University as block grants, and it will be the duty of the Finance Council, after receiving recommendations from the institutions concerned, either direct or through the Academic Council and the Senate, to allocate this grant. The creation of a Finance Council

competition was not the chief motive force. The millionaire was not the supreme human product.

Altogether the lecturer did not think that those who wished to keep the masses in a servile state—if there were any such left—could appeal successfully to biology in support of their views. A society with well marked castes might be successful, partly because by encouraging good traditions of skill and acquiring a certain element of specialization it mitigated the competition, but not if it included an ignorant and wretched proletariat. The plan of developing to the utmost a small selected class had been tried several times, but it had not been proved that equally good results might not have been obtained by other methods involving less injustice.

The Relative Importance of Nature and Nurture.

It had now to be considered (Dean Inge continued) whether civilization was working towards the degeneration of the national stock. It was necessary to take into account, not only the parasitism of persons or classes on the community, but the new danger that human beings might become parasitic to the machines which they had made for their own use. This last was obviously a problem which belonged to the human race alone. It would be generally admitted that social science had been too exclusively environmental, though it was not necessary to minimize what could be done by external means, such as education, sanitation, and increased opportunities for leading a healthy life. Sometimes the diseases which were supposed to be hereditary could be eliminated by scientific treatment, instancing the freeing, almost, of the Swiss valleys from goitre, which had been endemic there ever since the time of Juvenal. It used to be supposed, again, that Europeans were constitutionally unable to keep their health in a tropical climate, but it seemed now that in the absence of tropical diseases, such as malaria and yellow fever, which were being brought under control, even northern Europeans could live healthily in climates as hot as that of North Queensland. Still, when all had been said in favour of concentrating attention on the environment, the best authorities were unanimous that nature was far more important than nurture. Professor Karl Pearson had come to the conclusion that if the relative importance of nature and nurture in determining bodily and mental character were compared it would be found that nature was at least five times—perhaps even ten times—more decisive than nurture.

Hereditary Transmission of Characters.

Transmission of characters was now seen to be far more complex than was once supposed. Much might still be learned by collecting families and observing what qualities tended to reappear in the second and succeeding generations. Galton hardly allowed sufficiently for the good stock which the son of an able man possessed—the stimulating influence of the home circle in which he was brought up, the ambition to follow in his father's footsteps, the opportunities of good education which his father's success enabled him to procure, and, in some professions, such as politics, the opening which he secured into the profession by virtue of his father's prominence in it. It would also be found, if the literature of the subject were studied, how frequently striking pedigrees, such as the Bachs, the musicians, and in our own country the Darwins, made their appearance. A much larger number of pedigrees was needed, including not only five-talent but two-talent men. Inheritance of high stature and other physical qualities could not have escaped notice, and if matings were made with a view to preserving some particular character there was no reason why that character should not be secured. The qualities which led to distinction in humane letters appeared to be strongly inherited; the inheritance of skill in mathematics appeared to be more sporadic. The history of many professional families would be well worth tracing in detail.

The lecturer went on from this to speak of the falling birth rate among the professional classes. The higher races and classes were using the resources of scientific knowledge to reduce the death rate of the inferior and the birth rate of the superior. If *Who's Who* were opened at random and the number of children in fifty or a hundred consecutive entries were counted the average would be found to be slightly less than two for each entry, so that these families of moderately successful men were not keeping up their numbers. This relative sterility of the professional classes was a new thing; so was the sharp decline in the infant mortality of the slums; so was the feminist movement, which, according to some, was the most dangerous factor of all because it made the most intellectual women decline marriage or motherhood. Beyond all question the classes best endowed intellectually, and, in this country, the best endowed physically as well, were passing into a relative or even an absolute decline. Taking the country as a whole, the lowest birth rates were in the families of members of the medical profession, teachers, and ministers of religion; yet no more desirable parents could be found than the members of those professions. Before leaving the subject of good heredity, he called attention to one of the most remarkable examples of how a country might be permanently enriched by a very small accession of racial stock. To judge from the claims of some prosperous Americans, it might be supposed that the *Mayflower* was as large as the *Olympic*! But in fact only thirty-three pilgrim fathers founded families. The names of some of the most distinguished of their descendants included many Presidents of the United States, and other distinguished men in American politics, arts, and letters. Nearly half the distinguished men in America were descended from those thirty-three pilgrim fathers.

The Propagation of Bad Stocks.

Finally the Dean turned to the injury done to the national stock by the unchecked propagation of bad stocks. The feeble-minded were about 50 per cent. more prolific than the normal. The researches of Tredgold were decisive on that point. It was not generally known that although the death rate had declined rapidly, this decline had been entirely in the earlier periods of life. The expectation of life at 60 was no higher than it was two generations ago. From the age of 45 cancer began to levy a cruel toll on both sexes. Was the national physique improving or deteriorating? On the Continent it had been found that the stature of Danes had risen appreciably during the last fifty years. The average height of the Dutch had risen during the last third of a century. In France the average height of women was said to have increased by 3 cm. during the last eighty years. There were no figures, apparently, available for England, but recently in the *English Review* certain statements were made suggesting that there had been a marked deterioration among the people of this country. It would be interesting to know whether those statements could be challenged. The matter was serious, especially if, among Continental peoples, the tendency was the other way.

There was another means, besides dysgenic selection, by which the stock might be impaired. Modern workers were parasitic to the machine which had ousted them from natural human occupation. Apart from the machine they would be helpless, even in the presence of abundant material. A company of such men, left to themselves without their machines, would most likely perish.

Nevertheless, he was inclined to hope that it was not too late to stop the mischief, which had not yet had time to go very far. We must hope for the generation of some social antitoxins. We were not yet a degenerate people. We were a race to which any man might be proud to belong. But society was not at present in a healthy condition, and unless the problem of racial decay were taken in hand it might be too late. All they could do at present was to persuade their countrymen what were the pressing problems—so very different from those in which politicians interested themselves. The great medical societies could do much if they would speak out. They did not realize how eager the public would be to listen to them. The modern man might deny that he had a soul, and forget that he had a mind, but he was acutely conscious that he had a body, and accordingly he had a great respect for the doctor. Personally the Dean wished that the medical societies would testify, for when they spoke he nearly always agreed with them.

remove. The lawyer finds it a little more difficult to draw a parallel, for he—the barrister at any rate—sees for the most part the seamy side—the evil passions, the obstinacy, the falsehood, and the cunning, by which the good in human nature is so commonly perverted when it gets into the law courts. Though we may agree that the Bar has been and is one of the chief bulwarks of our liberties, the change in mentality which comes over the better sort of advocate when he reaches the Bench is one of the curiosities of psychology. Some other professions—the chemical and engineering, for example, which have to do with bodies possessing properties which can be exactly measured and controlled, and their actions and reactions foreseen—do not venture on a comparison, and all that Sir William Bragg, speaking at the dinner as a physicist and chemist, could claim was that chemistry and physics were able to help medicine in many ways, and thus in part to repay the debt general science owed to the physician at the time of the great renaissance of science which marked the close of the seventeenth and the opening of the eighteenth century.

The Prime Minister had an easier task when he compared medicine with his own profession of politics. Both are attended by the uncertainties and surprises inseparable from the idiosyncrasies of man, the variations between individuals and in the same individual at different times. *Varium et mutabile*, though said of woman, is true also of the other sex. It is one of the conditions the politician must accept, as it has to be accepted also by medicine—with this difference, that the patient is perhaps on the whole more loyal to his doctor than the voter to his party leader. Possibly that is because, as Mr. Baldwin admitted, legislation so seldom produces immediately the result desired. Sometimes the law courts decide that Parliament has not said what it meant; sometimes the results sought, though they are attained in the end, are long in coming, and the voter, growing impatient, seeks another opinion and installs new rulers; sometimes changes at home or abroad alter entirely the nature of the problem to be solved. Perhaps Mr. Baldwin made his best point when he likened the community to the living body, for his description of the State might be applied without alteration to the living body—an infinitely complex assembly of growing structures, the cells that compose it being always born and always dying, while throughout the change a moving equilibrium of the whole is maintained. Sir Berkeley Moynihan worked out another happy example of an analogy, suggested by Dr. Robert Hutchison, and ingeniously sustained it in light and humorous vein.

Sir James Berry's speech from the chair afforded an instance of a quite other sort of purpose an after-dinner speech may be made to serve: it may be used, as he used it, to raise on an informal occasion a matter of serious import. His point was that one after-effect of the war had been the spreading over this and other countries of a wave of enthusiasm for operative surgery. When he said that major operative surgery should rest on a solid foundation of pathological anatomy, and that war surgery, mainly the surgery of injuries in healthy men, was not in itself alone a complete school for the surgery of civilian practice, he no doubt only expressed an opinion to which the majority of the profession would subscribe. His further statement that many difficult and dangerous operations are being undertaken by those whose training, experience, and judgement are often insufficient was, we readily believe, made from a stern sense of duty and with reluctance. It needed, as Sir Berkeley Moynihan afterwards observed, some courage to say such a thing. Of the extent to which it is justified we have no means of forming any reliable judgement. That it will cause some resentment our correspondence columns already afford evidence. If it gives rise to a temperate and reasoned discussion within the medical profession it will probably have done good, but it has already been seized upon by some of the less responsible newspapers. This is unfortunate, though no doubt inevitable.

ACUTE POLIOMYELITIS.

THERE seems, we are glad to say, to be some reason to believe that the crest of the wave of the epidemic of acute poliomyelitis has passed, for we understand that the notifications, which reached a total of 319 in October, numbered only 65 in the two weeks ending November 13th. If this happens it will be in accordance with previous experience, as the disease in this country has usually reached its greatest prevalence in the summer and declined at the beginning of the winter. The statistics of the incidence of acute poliomyelitis and polio-encephalitis given to the House of Commons by the Minister of Health on November 23rd (p. 1026) indicate that though the disease in other countries as well as in this did not disappear during the first half of 1925, its incidence was much lower than in the second half of that year. In England and Wales the contrast is of 132 to 290. In the Scandinavian countries, including Finland, the number of cases notified in the first six months of 1925 was 136; in the second six months of 1925 it was 578. The figures for Norway apply to the towns only. The number of cases in England and Wales in the first six months of this year was 136; since the beginning of July the number of cases notified of acute poliomyelitis (alone) has been 738. That we must not assume we are yet out of the wood is shown by the facts mentioned in another column this week (p. 1019) by Dr. J. E. O'Connor for the Leicestershire and Rutland Combined Districts, and by Dr. Clapperton as to Oakham. The first two cases occurred in Oakham during the week ending October 9th, and there were two cases—one each in the urban and in the rural district—as late as November 6th. The outbreak at Grays Thurrock, so carefully studied by Dr. Boul, medical officer of health, occurred at the usual season. It will be seen from the abstract of his report, published at page 1007, that the chief prevalence was in July and August; the number fell from 31 in August to 6 in September, and there has been, we gather, no case since. The details of the Grays epidemic, so fully obtained by Dr. Boul, afford strong evidence that the disease is communicated either directly by association between one person and another, or, as other observations have made pretty certain, by carriers. Dr. Boul was able to discover 58 cases, and of these 11 died; this is a death rate of approximately 19 per cent., and therefore rather less than that observed in the great epidemic in New York in 1916, when it was 25 per cent., but higher than that of 10 to 12 per cent. commonly assigned. This, however, is only part of the toll taken by the disease, for 28 of the persons attacked at Grays are left with a greater or lesser amount of paralysis. The position with regard to Uppingham School appears to be satisfactory; since the school was disbanded only one case has occurred, in a boy who was attacked in his own home. It will be remembered that, owing to the occurrence of two cases of poliomyelitis, the school was closed on November 13th, and the boys sent home by the authorities for sixteen days, and told to return on November 29th. The wisdom of this decision was challenged by Lord Dawson of Penn and Dr. James Collier in a letter published in the *Times* of November 16th. On November 18th the school

on the lines proposed will enable men of great experience in finance and public and municipal work to take an active part in the promotion and advancement of University matters in London. In the past, owing to the constitution of the Senate and the method of administration such a constitution entailed, it has not been possible to any great extent to appoint men to the Senate who had such experience.

HOSPITALS AND ROAD ACCIDENTS.

It is of some interest to recall the forebodings of disaster and danger that heralded the coming of the railway train, and to note how amazingly safe the railroad has proved. The motor car did not arouse similar fears at its coming—merely popular curiosity. The red-flag-to-the-fore of its early days was a relic of the fear of the locomotive. The automobile has increased local mobility in astonishing fashion. No one thinks anything of a fifty-mile run; it will be done on the spur of the moment, with no more preparation than securing a can of petrol. But it has brought more problems than did the revolutionary railroad, for the car has penetrated our common life, and not been built up alongside it like the railway. Local mobility has increased to such an extent that it has almost choked itself. Hence the problem of the city streets, and of by-passes and of parking. Road accidents on the highways, at crossings and bends, are in a different category. Here the primary cause of accident is speed. When cars were unreliable machines half of the driver's consciousness was absorbed in listening to the sounds of his car; such speed as his car could accomplish he dared not attempt, because of that dubious sound which might threaten a breakdown. Now smooth, almost inaudible, swiftness is the common measure of the least of cars. Fifty miles an hour can be touched on a fair road, and the high average of thirty miles an hour for long journeys is within the compass of a car costing a hundred and fifty pounds. The ease of speed makes speed easy. Driving becomes monotonous; slackness and rashness are engendered. At the moment of stress the driver is at fault. He is too late in slackening speed, too eager to seize an advantage, too sudden with his brakes, and there is a crash. The consequences are recorded daily in the press.

The frequency of these road accidents is causing a serious disturbance of hospital bed accommodation. Beds that were intended and are needed for the sick poor are occupied by the victims of motor cars. We hear of hospital wards where there is no room for appendix cases because all the beds are occupied with accident cases. Again, the finances of the hospitals are disturbed. Funds that were given by benefactors for the sick poor are diverted to the relief of those well able to pay for their treatment or for whom insurance should provide. The doors of the hospitals are rightly ever open to the call of the injured, whether he has fallen amongst thieves or been mangled by a car. But, unlike the good Samaritan, who paid his two pence to the innkeeper for the care of the injured stranger, those concerned with the victims of motor smashes too rarely remember the cost to the hospital, and the skill and care of the hospital doctor. Mr. Bishop Harman, in his paper on "The modern hospital conception," read at Windsor (p. 984), calls this exploitation of the hospitals and their staffs "modern hospital abuse," and roundly charges the wealthy insurance companies and their shareholders with exploiting charity for the business of earning dividends. Part of the blame for this lies with the hospital boards and medical staffs; they have not readily asserted their just claims. But there are signs of an awakening. In recent issues of the Journal we have quoted reports of action or projected action by hospital boards coming from widely separate parts of the country, the latest from Edinburgh and Aberdeen. New accident wards are being provided, and the cost of these and their upkeep should be met by the recipients of the treatment or by those who act on their behalf. We hear of one such ward to be opened shortly at the West London Hospital, where the munificent donor of the ward and its equipment stated that he was prepared to meet the deficit on the upkeep of the ward provided the patients paid such share as they were able. That stipulation is a sign of the times.

The subject of the attitude hospital authorities should take up with regard to cases of accident admitted to their wards when the injured person is insured was considered by the Annual Representative Meeting of the British Medical Association in 1925, and again this year. The opinion was unanimous that in all such cases where medical attendance is covered either directly or indirectly by insurance, the hospital authorities should recover from the insurance company the full cost of maintenance and treatment of such patient. The Representative Body also recorded its opinion that where patients who would ordinarily be considered as private patients are admitted to hospital solely on account of accident or emergency, they should be considered "private patients." Members of the staffs of hospitals will no doubt be glad to quote this expression of opinion by the Representative Body to reinforce advice they may themselves think it proper to give to the boards of their hospitals.[1] It is to be anticipated that the members of such boards will appreciate the equity of the suggestion, and the directors of the Aberdeen Royal Infirmary have already resolved to ask insurance companies to accept responsibility, while at Edinburgh the matter is to be raised again at the beginning of next year, when a return of the number of cases admitted to the Royal Infirmary owing to motor accidents will be available.

ANALOGIES AND CRITICISMS.

After-dinner speaking is a difficult art, and unless it reaches the high level attained at the annual dinner of the Royal Society of Medicine last week listeners are apt to be disappointed. At a medical dinner it is customary for a speaker not belonging to the medical profession to seek for some ground of analogy or comparison between it and his own. We have all appreciated the generous attempts of clerical speakers to recognize an alliance or similarity of purpose between Medicine and the Churches, and some of us think we have detected an increasing disposition to answer the question, Who shall minister to a mind diseased? by saying, "Both of us working together." Evidence is increasing that the wiser among the clergy are learning one of the lessons which medicine has to teach—namely, that really bad people are very few, and that much of the irritability that spoils domestic life and leads to deeds of cruelty and violence is due to physical causes which medicine can alleviate or

[1] The resolution was approved at the Annual Representative Meeting in 1925. At the meeting this year it was formally adopted and became the policy of the Association. The full text will be found in the Supplement of July 24th, p. 55.

He advances reasons for rejecting the common view that the great increase of population, during the years when industry began to feel the influence of the discovery of the steam engine, and with it the development of factories and machinery, was due to an increase in the birth rate consequent on the promiscuous herding of families in industrial towns; he attributes it to an astonishing decrease in the death rate, consequent on town improvements and on a raising of the standard of social hygiene and public health. He points to the increased wealth of London, where the commerce and foreign trade of the country were concentrated. Ship-building and other industries developed rapidly; and the demand for agricultural products to feed the growing population of London and of the industrial cities stimulated agricultural improvements, and led to increased facilities for transport by land and water. Food became cheaper and abundant; and sugar and tea were added to the national food supplies from our oversea possessions. With these the "grim spectres of famine and pestilence, which were never far distant" in previous years, were laid. Better building materials were brought to the towns owing to better transport facilities and the increase of capital; streets were widened and paved, drains were covered in, water supplies were improved, and easily washable cotton took the place of woollen clothing, leading to greater personal cleanliness, while iron bedsteads in place of the old wooden constructions diminished vermin. To the wealth of London is also attributed developments in medicine and in social philanthropy, such, for instance, as the great hospital movement of the eighteenth century. All of these factors had, Mr. Buer considers, an astonishing effect on the death rate. The sources of information regarding vital statistics of the period are limited, and consist mainly of parish registers, bills of mortality, certain taxation returns, and estimates of population by Rickman and Finlaison, and of the Carlisle tables compiled by Dr. Heysham in 1815. Mr. Buer discusses their value in a lucid manner, and points out certain errors and false deductions which have been made from them. He exemplifies the influence of individuals of force and character in bringing about the changes in public health to which he attributes the rapid fall in the death rate. As Arthur Young, the agriculturist, said at the end of the eighteenth century, "Everything is well done in England except what is done with public money," and he instanced the practical results of individualism as opposed to bureaucracy. In his chapter on the pioneers of public health Mr. Buer enunciates a truth when he states that "war was a great stimulant to advance in medical practice, and that the origin of modern public hygiene must be sought in the departments of naval and military hygiene." The outstanding naval and military figures of the period were Pringle, Lind, and Gilbert Blane—incidentally, Mr. Buer omits Jackson, who was probably greater even than these—while Percival and Ferriar in Manchester and Currie in Liverpool are mentioned as the prime movers in public health reform in civil life and in the organization of civil hospitals and dispensaries in these cities. Mr. Buer's essay is a valuable addition to the history of medicine and social hygiene, more especially as it comes from the pen of one who has studied closely and accurately the social and health conditions of the latter half of the eighteenth and early years of the nineteenth century from a political economist's point of view.

AWARDS AND DECORATIONS.

The Royal Society of Medicine has honoured itself by presenting its gold medal to Dr. J. S. Haldane, F.R.S., of Oxford. It is a suitable recognition of a long life devoted with singular, but hereditary, ability to the study of some of the most fundamental problems of physiology. There can be no more fundamental problem than that of respiration—its smooth working in health so that we are unconscious that it is going on night and day, and its disturbances by abnormal conditions in the environment. While his outlook on life is that of the philosopher, he has never lost touch with practical medicine, and of this his many contributions to our columns are evidence. His researches have elucidated the physiological conditions of respiration at high elevations as well as those which arise in the vitiated atmosphere of mines. The medal was founded by a gift from the late Dr. Robert Murray Leslie, and previous recipients have been Sir Almroth Wright (in 1920) and Sir F. Gowland Hopkins (in 1923). The society has also received a most welcome gift from Sir StClair Thomson, consisting of a chain to be worn as a decoration by its president on formal occasions. It is of 20/22-ct. gold, and has forty-nine links. It is unquestionably at least 300 years old, being described by the experts who have seen it as "*circa* 1600." Its authenticity and artistic value have been vouched for by experts at the South Kensington Museum and by well known artists, and Royal Academicians have expressed the opinion that there is no more beautiful chain of office in London. The colour of the gold is very deep, and the patina is of an exquisitely mellow quality. The form of the links is interesting, as each is composed of two delicately pierced concave discs placed rim to rim, the appearance of one link very much resembling a flattened pomander ball. There are two designs of link, one having eight cusps and the other four cusps on its circumference, alternating with radial arms. There is no history obtainable as to the original purpose of this chain. It is doubtless of Italian workmanship, and is such a chain as may frequently be seen in pictures of statesmen and princes of the Cinquecento. The Royal Society of Medicine has decided that its present badge is out of harmony with the chain. This badge is, in fact, that of the Royal Medical and Chirurgical Society, to which it was presented by Sir Edward Sieveking in 1890. The council intends to apply for a grant of arms, the shield of which will no doubt be reproduced in a suitable badge, and has accepted Sir StClair Thomson's offer to defray the expenses connected with this so that the chain and badge may be complete.

AMERICAN IMMIGRATION LAWS.

The effects of United States immigration laws are engaging the attention of American sociologists. Dr. Clifford Kirkpatrick has published a detailed examination of the effects of immigration upon the intelligence of the population as measured by modern psychological tests. He gives an account of the methods of study, the work of previous investigators, and of an extensive investigation of his own, in a work entitled *Intelligence and Immigration*.[1] He concludes that there was at one time a supreme opportunity for developing a population of the highest quality in certain respects by the careful selection of immigrants, but that the opportunity was little appreciated. In general the findings of his study give little credit to the immigration policy of the past. He owns that intelligence is not the only trait of social significance, and that innate traits do not altogether dominate cultural considerations. Italians may have musical ability that goes far to balance deficiencies in other respects. Nevertheless, the findings indicate that there is a serious tendency for groups, apparently of lower intelligence, to be the very groups that in the last two decades have entered the country in the greatest numbers. There are exceptions. Some of the Jewish peoples are possessed of considerable ability. The Finns compare favourably with some Americans. It is

[1] *Intelligence and Immigration*. By Clifford Kirkpatrick, Ph.D. Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1926. (Med. 8vo, pp. 128; 5 figures. 18s. net.)

authorities for the first time consulted Sir Humphry Rolleston, and as a result the above decision was reconsidered. The parents were informed that, as it was impossible to give an assurance that no further cases would occur when the school reassembled on November 29th, it had been decided that the boys should not return to school this term. The advice not to reopen before Christmas was based on several considerations, such as the desirability of allowing for a fully ample period of incubation and accompanying quarantine; the short duration of the remaining term (just over three weeks from November 29th); and the possible untoward influences of travelling in winter on the boys' resistance, and of a return to the environment where two cases had already occurred. We feel that we are absolved from now discussing further the policy of disbanding Uppingham School by the letters which, in response to our requests, we have received from Dr. Miller and Dr. Dunn; they are published at page 1019.

MERCUROCHROME.

During the last decade an intensive search has been pursued for some drug which will act as an internal disinfectant in cases where bacteria have established themselves in the body. Numerous new drugs have been prepared by organic chemists, but in most cases the clinical results have been disappointing. In the case of the dye mercurochrome-220 there is, however, a very considerable quantity of favourable clinical evidence, which has come from several different countries. Mercurochrome-220, or di-brom-oxymercuri-fluorescin, was introduced in 1919 by Young, White, and Swartz. The number attached to the name indicates its place in a series of disinfectants examined by these workers at the Brady Urological Institute, Baltimore. The drug has been found to be a general disinfectant of high value, and when applied in 2 per cent. solution to open wounds or mucous membranes it exerts a powerful and prolonged disinfectant action and produces little local irritation. The action of the dye as an internal disinfectant has, however, attracted especial attention; it is given intravenously in 1 per cent. solution in doses up to 5 mg. per kilo body weight. The drug has been tried in a large number of different types of infection, and some very remarkable results have been recorded. In a recent communication Young[1] gives records of 680 cases treated with mercurochrome-220. His records show that in 173 cases of septicaemia a cure was effected in 63 per cent. Successful results are also recorded in leprosy, anthrax, and malaria. In acute encephalitis his records show that five cases were treated and that all were cured or improved, but that in residual cases no improvement occurred. The drug was used by Dr. Dunn in the second case of polio-encephalitis at Uppingham School. A single intravenous injection, given within a few hours of the onset of symptoms, was followed by an immediate improvement, and on the fourth day the boy was convalescent. Young did not find much benefit to follow the use of mercurochrome in ten cases of meningitis. Others have given rather less favourable reports than Young of its action in various diseases, but most observers are agreed that the drug often produces remarkable benefit, even in severe cases of generalized infection. The clinical reports are supported by extensive laboratory experiments. Young, for example, tested the drug in pneumococcus septicaemia in rabbits and in anthrax in guinea-pigs, and found that practically all the untreated controls died, but that mercurochrome injections saved about 50 per cent. of the animals. The drug is, of course, a powerful agent, and therefore can produce undesirable side-actions. The most unpleasant side-action is a painful colitis due to the action of mercury on the gut. Some workers also have accused the drug of producing kidney injury—an effect that is likely to follow the intravenous injection of any organic mercurial drug if given in large doses. Young denies, however, that this is a serious danger if proper care is exercised. Time is of course needed in order to arrive at a final estimate of the value of any new drug, but the evidence existing regarding mercurochrome-220 is sufficient to entitle the drug to the careful consideration of the medical profession in this country.

[1] *Journ. Amer. Med. Assoc.*, 1366, 87, 1926.

ERRORS IN DIAGNOSIS.

If there is one thing the doctor would like to repress into his "unconscious mind" it is the remembrance of his errors in diagnosis and treatment. The repression, however, might cause some dreadful complex of depression; so that perhaps it would be better if the peccant practitioner sought help against future blunders by reading Sir David Drummond's article in the October issue of the *Newcastle Medical Journal*, now edited by Dr. F. J. Nattrass, on "Our mistakes and how they are made." We all make mistakes, Sir David Drummond says truly; whether everyone acknowledges all his mistakes is, perhaps, debatable. Unfortunately, we must agree with him that most of our mistakes in diagnosis are avoidable; and that the commonest explanation of a diagnostic error is carelessness. To plead, as an excuse for carelessness, overwork or lack of time is, says the author, no vindication, since no man is justified in undertaking more than he can perform. This, however, is a hard saying, because some doctors have more work thrust upon them than they would wish to undertake. Sometimes trouble in diagnosis arises because the doctor is looking for a complete clinical picture, and fails to recognize a case in which some usual symptom of the disease happens to be absent. In other cases a careful history of the patient has not been taken; or all the possibilities in a difficult and doubtful case have not been reviewed. Many of our profession, it is said, have fallen into a bad habit of postponing the investigation of a new case until a more favourable season, with the result that a mental impression of the condition, based upon nothing substantial, is accepted as diagnosis. Sir David Drummond objects to the "snapshot" diagnoses of the man who relies on his clinical instinct; and he calls attention to two curious psychological sources of error—the tendency in some men to seek an unusual diagnosis while overlooking the commonest cause, and the habit of others of allowing the mind to be influenced unduly by the findings in a previous case. Several of these causes of error are illustrated by cases which have been met with by Sir David Drummond during his practice as a consultant; but he has not gratified our curiosity by confessions drawn from his own soul.

PUBLIC HEALTH IN THE INDUSTRIAL REVOLUTION.

Political economists do not as a rule interest themselves to any great extent in medical science, but Mr. Buer, the lecturer on economics in the University of Reading, must be regarded as an exception. He has written an essay[1] on health, wealth, and population in the early days of the industrial revolution, which deals almost entirely with vital statistics, town improvements, water supplies and drainage, British pioneers in public health, hospitals and dispensaries, general hygiene, and midwifery during the period 1750 to 1815. He discusses also rickets, scurvy, antiseptics, leprosy, plague, small-pox, typhus, fever hospitals, and malaria.

[1] *Health, Wealth, and Population in the Early Days of the Industrial Revolution.* By M. C. Buer, B.Sc.(Econ.). London: Routledge and Sons, Ltd. 1926. (Demy 8vo, pp. xi + 290. 10s. 6d. net.)

AN EPIDEMIC OF POLIOMYELITIS IN ESSEX.

Report by Dr. Boul, M.O.H.

The town of Grays Thurrock, on the north bank of the Thames below London, has suffered during the present year from an outbreak of anterior poliomyelitis. There were 58 cases in all, and 11 of these have died. The population of the area affected is about 25,000. We are indebted for the following particulars to a report Dr. W. T. G. Boul, medical officer of health for Grays and Tilbury, has placed at our disposal.

It would appear that four patients sickened in Grays with poliomyelitis on widely spaced dates in May, 1926. Two of the four were not notified; they were discovered about two months later. During June and the early days of July no cases are known to have occurred. On July 6th a more active phase began. Two patients fell ill on that day and one on the day following. Then cases sickened on July 9th, 10th, 13th, and 18th—two on each; and there were single cases on six other days up to the end of the month, making a total of 17 cases for July. On August 3rd the outbreak reached its acme. On that day four patients sickened. On each of three other days in August three persons became affected. The total number of cases in August was 31. There were 6 cases only in September; the last fell ill on September 21st. The dates of sickening of the 58 cases, and the number on each day, are shown in the following table, which has been prepared from data contained in a report on the epidemic by the medical officer of health of Grays and Tilbury.

"abortive" respectively. The real cases, 39 in number, are those which developed the forms of paralysis characteristic of poliomyelitis. The abortive cases, numbering 19, had the symptoms of invasion only, such as fever, vomiting, and pain in the neck. The proportion of abortive to real cases was in May as 1 to 3; in July as 6 to 11; in August as 11 to 20; and in September as 1 to 5. From these figures no significant conclusion can be drawn. In view of the association of abortive cases with real cases to which they led up or on which they followed, their inclusion as cases in the sum total of the epidemic would appear to be warranted. Of the 11 fatal cases, 9 died after less than three days' illness; of the remaining 2, one died later of bronchitis, and one of a relapse of poliomyelitis with extension of the paralysis. The fatal cases remained fully conscious until near the close. "A peculiar movement of the muscles of the throat and floor of the mouth" was noted as a sign of impending death. Three patients who presented symptoms polioencephalitic in type recovered. None of the deaths occurred in July or in the early days of August, by which time 32 of the 58 cases had sickened. The maximum virulence of the disease, therefore, was not coincident with the period of rising infection.

Poliomyelitis at Grays, May 3rd to September 21st, 1926. Number of Cases and Dates of Sickening.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	25	27	28	29	30	31	Totals.
May			1							1															1						1	4
June																																
July						2	1		2	2			2				1	2				1	1		1		1			1	17
August ...	2	1	4	3	1			2	3	1			1		2	2	1		3					1		1		1	1	1	31
September ...					1				1			1	1			1					1										6
Total ...																																58

Missed Cases.

Of the 58 cases, 11 were missed, or delayed in notification. Of the 4 cases in May, 2 were missed; of the 17 in July, 6; of the 31 in August, 3; and of the 6 in September, none. The ratio of the missed to the total cases fell progressively month by month—a frequent experience during the currency of an epidemic when the public become alive to its danger. One missed case, a child which sickened on July 7th, was out and about in the town for ten days until isolated by the health department. During this time it infected one of its playmates, also a missed case, by whom the disease was distributed, directly or indirectly, to many.

Missed cases played a part also in keeping infection alive in a detached group of houses, which is situated at cross-roads on a building estate now in course of development in a new part of the town. Two cases here in July were followed, after an interval of three weeks, by three others. The gap, on investigation, was found to be bridged by two missed cases in adjacent houses, both of whom, when they came under notice, exhibited marked paralyses. As the missed cases were in the habit of playing with other children at the cross-roads there was ample facility for the transmission of infection. A similar localization, with one missed case, was observed in the old part of the town. Out of nine houses standing in a row three became infected, with 3, 3, and 1 case respectively in the several houses. The missed case, one of three in the family, was in the centre house of the row. The father of this family had himself suffered from poliomyelitis three years before, and showed permanent paralysis of one leg in consequence.

"Real" and "Abortive" Cases.

The cases in the outbreak are divided by the medical officer of health into two groups, entitled "real" and

Age Incidence and Mortality.

Dr. Boul, in his report above referred to, comments thus on the age incidence and mortality of attacks:

"Of the 58 cases, 4 only occurred in adults, at the following ages: 17, 18, 22, and 36. Two of the adults died, a mortality rate of 50 per cent., but the numbers are too small for importance. The principal age affected was 2-3, where 13 cases occurred. The periods 0-1 year and 10-15 were comparatively free from cases. Whilst the general mortality rate is 19 per cent., the mortality rate at the age of 2 is 38 per cent."

Signs and Symptoms.

The percentage frequency of the signs and symptoms observed was ascertained to be as follows: Fever 100, twitching 66, vomiting 62, pain in neck 48, pain in back 10, retention 10, pain in limbs 16, drowsiness 39, headache 20, diplopia 8, Kernig's sign 2, nystagmus 2, diarrhoea 4, sore throat 2. On symptomatology Dr. Boul remarks:

"With regard to the actual symptoms shown, a careful history of each case was kept by myself. The most constant symptoms are in the following order: (1) feverishness, (2) twitching, (3) vomiting, (4) pain in the back of the neck. The twitching may be general or confined to one portion of the body only. The vomiting usually occurs on the first or second day only, and it is rare for the patient to vomit more than three times. The speech was affected in three cases only, in one case of which the child had also sore throat and may possibly have been a diphtheritic paralysis, although a swab taken gave a negative result. Vesicles resembling varicella were seen upon the limbs of three of the children, but not until some few weeks after the initial illness. Prodromal symptoms occurred in two cases only."

Diagnosis.

Dealing with diagnosis, Dr. Boul writes:

"The differential diagnosis is extremely difficult in the early stages. Cases of feverishness with vomiting are common enough in children of the age 2-3. An important point is the lack of intestinal signs. Apart from the limited amount of vomiting, pain in the abdomen and other signs pointing to an illness of intestinal origin are conspicuous by their absence. The most valuable symptoms are undoubtedly pain in the neck and back

thought probable, on the other hand, that the Italians, the Poles, and the Russians have a depressing effect on the average of American intelligence, and that the French Canadians have not raised it. Since much of the evidence is derived from the achievement of school children rather than from the immigrants themselves, even making due allowance for the influence of a language handicap, the findings are such as to raise grave doubts as to the success of the "melting-pot." There is another aspect of the matter which it is considered makes the shortcomings of the past immigration policy more serious—differential birth rates. The data collected appear to show that the higher birth rate is associated with inferior qualities. The author criticizes the "group selection" put into force by the law of 1924; there is, he says, no doubt that tremendous overlapping occurs, and that the best of the Southern Europeans are far superior to the poorest of the Northern. He would have an individual selection of immigrants based on scientific measurement and evaluation made as completely objective as possible, and the selection, he considers, should be made in the Eastern hemisphere. The effects of such a fine-tooth comb may be imagined. So far as it was effective its tendency would be to denude Europe of its best for the benefit of the United States of America. Possibly there would be a revolt on this side against such a policy, and it is conceivable that the States might be made to pay in cash for the value of the immigrants they receive.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE annual dinner of the Society of Medical Officers of Health was held at the Piccadilly Hotel, London, on November 18th, with the President, Dr. E. H. Snell (M.O.H. for Coventry), in the chair. In proposing the toast of "Prosperity to the Society," Sir Robert Bolam said that he brought a message of goodwill from the British Medical Association. Isolation of the medical officer of health was not in the interest of the common health, and reciprocity of ideas and knowledge between the Society and the Association was most beneficial to all. He coupled the toast with the name of the President, who during twenty-eight years of good work for his city had given much help on committees of the British Medical Association. Dr. Snell, in reply, spoke of the increasing intimacy between the Society and the Association that had grown up during Sir Robert Bolam's term of office, and gave a most entertaining retrospect of the progress of hygiene in the seventy years of the Society's existence. The health of the visitors was proposed in warm phrases by Dr. Charles Sanders, whose text was: "A society is known by the guests it entertains." The toast was responded to by the Duchess of Atholl, M.P., Parliamentary Secretary of the Board of Education, the Right Hon. Philip Snowden, M.P., formerly Chancellor of the Exchequer, and Sir John Rose Bradford, M.D., F.R.S., President of the Royal College of Physicians of London. The Duchess of Atholl expressed the opinion that the greatest development in the past twenty-five years had been the inception and growth of the school medical service. Another gain had been the assistance given to the cause of health by women members of Educational Committees. She ended with a tribute to the work of medical women in school hygiene. Mr. Philip Snowden said that he long ago came to grasp the importance of the public health side of local government. Whereas in Parliament one saw little if anything of the results of weary hours of debate, in local government one could see things being done. He paid a high tribute to the permanent officials of the country, and medical officers not least among them, for their loyal, enthusiastic, and able work. Speaking of the great attractions and opportunities of the public health service, Mr. Snowden declared that good salaries for good men were good economy; the country, he said, could not afford to retrench in its expenditure on health services. Sir John Rose Bradford said that his presence at that gathering in the capacity of President of the Royal College of Physicians would show that there was no separation between curative and preventive medicine, and that the branch with which the Society was associated was one that every physician had at heart. The only thing that made him a little unhappy was the fear that if preventive medicine continued to forge so rapidly ahead, his present office might in time become obsolete!

ROYAL MEDICAL BENEVOLENT FUND'S CHRISTMAS GIFT.

IT has been the practice of the Royal Medical Benevolent Fund for many years to present to the annuitants and some of the most necessitous grantees a Christmas gift of 25s. The Treasurer now makes an appeal for £370 to keep up this practice. The committee has not in hand any special fund to draw upon to meet this Christmas gift, to which the recipients in former years are no doubt looking forward. It is a gracious and friendly act, and we have no doubt that many readers will wish to make the continuance possible. Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at the offices of the Fund, 11, Chandos Street, Cavendish Square, London, W.1.

AN Association of Special Libraries and Information Bureaux has been formed in London, and is preparing, with the assistance of the Carnegie Trust, a directory of sources of specialized information in the British Isles. Membership is open to all interested bodies, and the subscription is two guineas a year. A copy of the directory will be supplied to members as soon as available. Further details can be obtained from the secretary of the association (38, Bloomsbury Square, London, W.C.1). In order to ensure the establishment of the scheme on an adequate scale it is hoped to obtain not fewer than five hundred members by March, 1927.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee fifty-eight cases were considered and £784 9s. voted to fifty-two applicants. The following is a summary of some of the cases relieved.

Widow, aged 59, of M.D. 1889 who died in 1914. She has three children. The son, aged 26, is in a mental hospital. The younger daughter, aged 22, is a probationer nurse, and the applicant is dependent on the elder, aged 23, who earns £2 a week as a clerk. Until three years ago the applicant maintained herself. Voted £26 in twelve monthly instalments.

M.D.Glas. 1885, a widower, aged 68, who retired on account of ill health and deafness. He now lives with a son who is a minister with a small stipend. A daughter earns £75 a year as a secretary. He asked for a grant to enable him to contribute towards the board of himself and his personal attendant. Voted £40 in twelve monthly instalments.

Widow, aged 58, of L.R.C.P.I. 1898 who died in 1904. Only income is rent from a house £65 per annum net. Has one room at a cost of £31 4s., including coal. No children. Insufficient income to cover necessities and clothing. Voted £10 in two instalments, and clothing.

Widow, aged 73, of L.R.C.P.Edin. who died in 1920. Her eldest son allowed her £20 a month until his death in January last. The second son is not in a position to make a regular allowance, but helps to the best of his ability. She has no other income. Voted £36 in twelve monthly instalments.

Widow, aged 54, of M.R.C.S. who died in 1924. Owing to ill health she is unable to work. She lives rent free in a cottage and receives the rent, 5s. a week, of an adjacent one. She has no other means, but has received poor relief. Voted £26 in twelve monthly instalments.

Widow, aged 55, of L.R.C.P. who died early this year; he was in receipt of an Epsom pension, the old age pension, and an annuity from the Fund, all of which ceased at his death. The applicant is now looking out for work. The Fund has voted £17 since May, and £18 in twelve monthly instalments from November 1st next.

Subscriptions may be sent to the Treasurer, Sir Charters Symonds, K.B.E., M.S., F.R.C.S., at 11, Chandos Street, Cavendish Square, W.1.

The Royal Medical Benevolent Fund Guild still receives many applications for clothing, especially for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles. The gifts should be sent to the Secretary of the Guild, 58, Great Marlborough Street, W.1.

its peak, as a chart in the report illustrates, fourteen days after the influenza peak. From this time to the end of the year there is shown to have been an approximate parallelism between the curves, the encephalitis maxima occurring generally from one to three weeks later than the influenza maxima. Professor Wynne remarks that these results are particularly interesting in connexion with the suggestion of Mr. Lowndes Yates that influenzal infection of the accessory sinuses precedes the infection of the central nervous system by the encephalitis virus. On the other hand, it was found that, whereas there was a history of previous influenza in sixty-four cases of encephalitis, there was a history of sore throat in only nineteen. No reliable evidence was obtained that the disease was spread by direct contact, nor did any data emerge for computing the incubation period.

Pathological Report.

Investigations by the pathological department of the University of Sheffield included attempts to transmit the virus or toxins of the disease to rabbits and mice, necropsies, and the examination of specimens of the cerebro-spinal fluid collected during life. Professor J. S. C. Douglas reports that animals were inoculated with cerebro-spinal fluid from ten cases of epidemic encephalitis without showing during life any symptoms which could be ascribed to this disease, while *post-mortem* examination and histological investigations of the brain were similarly negative. Brain emulsions from patients who died were injected into animals without causing any symptoms of encephalitis or any specific histological change in the brain of the animals, thus confirming the common experience that the virus of this disease can only be conveyed to laboratory animals with great difficulty, if at all. The nasal cavities of thirteen patients were washed out with normal saline solution and bacteriological investigation was combined with animal inoculations. No symptoms of encephalitis resulted in any animals and no histological changes in their brains. Filtrates of faecal cultures were similarly negative. As regards *post-mortem* findings in thirteen patients who died from encephalitis, the associated lesions observed were: terminal recent infections of the lungs in ten cases; swollen mesenteric glands in six; recent slight infections of the alimentary canal in four cases; swollen spleen in four cases; granular kidney and pyelitis each in one case only. Professor Douglas regards these lesions as being accidental concomitants in the encephalitis, though in one case the lobar pneumonia appeared to be the actual cause of death. No important change was discovered in the brain except the frequent occurrence of slight congestion of the grey matter and less commonly oedema, but microscopical examination showed the presence of a small-celled infiltration, principally perivascular, in all cases except one. This change was very patchy in its distribution, and though not absolutely specific of encephalitis lethargica, is thought by Professor Douglas to be highly suggestive of it in the absence of other gross disease. In one patient, however, no small-celled infiltration was detected, although numerous sections from different parts of the brain were examined microscopically; the clinical manifestation of the infection extended over two months, and the absence of the typical small-celled infiltration is tentatively attributed to the healing of the original inflammatory changes in the course of time, the patient ultimately dying from lobar pneumonia. Cerebro-spinal fluid from thirty-six cases was examined and found invariably to be free from acid-fast and other bacteria, and to be sterile on culture; in only three cases was the albumin content increased, and in these the rise was explained by the presence of blood. The fluid reduced Fehling's solution in each case, but no quantitative determination of the reducing agent was made; in nearly every case the number of white cells was below 6 per c.mm. The epidemic had, therefore, the same pathological characters as those reported elsewhere.

Clinical Report.

Professor A. J. Hall and Dr. Gurney Yates preface their report with the statement that the 301 cases considered do not represent by any means the real extent of the epidemic. Many cases of encephalitis, even of a severe character, were otherwise diagnosed, and so were not notified. A still larger number of very mild or abortive cases were so indefinite as to preclude diagnosis. The primary attack was mild in about half the cases notified and severe in one-fifth. Complete recovery was more common in the milder cases, though Parkinsonism was a more frequent sequel of attacks of the mildest character. The death rate rose above the average when there was definite fever and vomiting, and fell below it when vertigo was the prominent symptom. It was highest when acute disturbance of the respiratory mechanism was present, particularly polypnoea, and also in cases with acute mental symptoms. Headache was the most common symptom, and sleep disorders, ocular palsies, and various motor phenomena were frequent.

The initial symptoms included slight pyrexia, sore throat, lethargy, insomnia, diplopia, vertigo, and attacks of disorderly breathing, sometimes of the asthmatic type. In the more severe cases the clinical features varied widely, positive motor phenomena often dominating the picture, and frequently simulating those of chorea gravis. The rapidity of their succession and their violence often led to extensive excoriation of the skin of the trunk or limbs, and exhaustion. As a rule they did not last for many days, but were followed by lethargy; myoclonus, however, continued sometimes for weeks or months. Epileptic convulsions occasionally ushered in the attack. In cases which proved fatal from the acute onset the positive symptoms usually changed to negative manifestations, such as lethargy, stupor, gradually increasing coma, profuse sweating, and a rising temperature. In a small number of cases a scarlatiniform rash appeared in the first few days, more commonly in young children. The primary attacks are grouped in the report into mild, moderately severe, and severe. A distinction is made between general symptoms, such as pyrexia, headache, vertigo, and vomiting, and indicator symptoms, including lethargy, with ocular palsies; insomnia with delirium; severe pain other than headache; and abnormal muscular movements.

Sequelae.

A questionary was issued in August, 1925, at the instance of the Medical Advisory Committee of the Sheffield Division of the British Medical Association in regard to those patients who had survived, and the results obtained include the following.

Ocular palsies rarely persisted, except in minor degree, but speech defects, though rare, might remain troublesome for a long time. Ocular palsy in association with sleep disorder seemed to have a favourable prognostic significance. Vertigo, when present in the primary attack, tended to disappear, but occurred first as a sequel on several occasions. Severe neuralgic pains only persisted in one-sixth of the cases in which they were present, and mental disorders continued in a modified way in half the cases in which they were acute in the primary attack. On the other hand, more cases are recorded as having mental residua at the end of the 1925 than the few in which they had persisted from the start. The form of sleep disorder present in the primary attack was found likely to be the form in which it persisted, if it did so at all. When insomnia occurred alone in the primary attack it tended to persist, but sleep disorder, in the form of nocturnal insomnia usually, might first appear as a sequel. No definite conclusions in respect of moral changes were reached: as a rule they were not clearly noticed until the patients resumed ordinary life after the conclusion of the primary attack. Respiratory disorders occurring during the onset did not persist; those appearing as sequels were very varied and not infrequently associated with nocturnal restlessness and Parkinsonism. They were more common in males than females, and the average age of the patients was about 15. This is in marked contrast with primary respiratory disturbances, which were found more often in females than males and had an average age of 28. Parkinsonism was much more common in males than females; it occurred chiefly during the age period 15 to 35, but did not seem to have any tendency to produce sterility in women. In more than one case pregnancy occurred during the disease, the patients usually having normal children after an easy, straightforward

and twitching, symptoms which do not occur in other childish disorders. The temperature is not usually high, and the lack of throat symptoms is important. The tongue is usually furred, but the breath not offensive as in complaints of intestinal origin. Very much has been written concerning the value of exaggerated knee-jerks. As a point of early diagnosis I am convinced that they are valueless. Exaggerated reflexes are common in many feverish disorders of childhood. The knee-jerk is often extremely hard to elicit in young children, a fact which may be confused with their absence, but two things are important: (i) exaggerated knee-jerk upon one day followed by lack of knee-jerk upon the next; (ii) a difference in the two legs. The knee-jerk is undoubtedly exaggerated in the early stage and lacking at a later date. Constipation was usual, but, contrary to the general opinion, nasal or pharyngeal catarrh was extremely uncommon. Retraction of the head occurred in about 10 per cent. of cases."

Measures taken to Check the Epidemic.

The methods adopted for the control of the epidemic were vigorous and comprehensive. Local practitioners were circularized and adjacent medical officers of health warned. The Ministry of Health was notified, and sent a medical officer to view the situation and advise. The throats and noses of contacts were sprayed with 1.5 per cent. hydrogen peroxide. Of the children sprayed one only contracted the disease. As the schools closed for the summer holidays the question of preventive closure did not arise. One case only was traced to school contact. Information and advice were given through the local press and by means of placards. Provisions of notable value were the opening of special wards in the isolation hospital for the reception of the sick and the reservation of beds in orthopaedic hospitals for their after-treatment where necessary.

Conclusion.

The Grays epidemic of poliomyelitis observed the rule of summer prevalence to which the disease generally conforms in England. It made no discrimination as between the new housing estate and the more crowded old quarters of the town. It was no respecter of social conditions or up-to-date sanitation. On the contrary, it struck hardest at the more well-to-do families. In 34 of the 58 cases the source of infection is believed to have been traced. Multiple cases in houses and streets were common, and the distribution of infected foci was general over the area concerned. The type of the outbreak was that of a communicable disease, spreading from person to person by contact or association through direct or intermediary channels. It has left in its track, at the date of Dr. Boul's report, 11 dead and 28 paralysed persons, with degrees of paralysis ranging from slight to complete. The dead and the maimed together amount to 39 out of 58 who fell sick; it is a casualty rate of 67 per cent. Happily this rate may yet be reduced by the orthopaedic treatment provided. There may be relief of the severer cases and cure of some of the milder. But in the end a residue must remain with varying grades of permanent incapacity—the usual aftermath of epidemic poliomyelitis, and its most formidable feature.

EPIDEMIC ENCEPHALITIS IN SHEFFIELD.

The Outbreak of 1924.

During the spring of 1924 a severe outbreak of epidemic encephalitis commenced in Sheffield as part of a pandemic which affected Western Europe, the United States of America, and Japan, as well as Great Britain. In this country, while every great town and many rural areas were affected, the highest attack rates were in Glasgow and Sheffield, the former city having 398 confirmed cases and Sheffield (with a much smaller population) 301. In London during the same year there were 541 cases, a figure greatly in excess of that of the previous year, though the case mortality fell from the high figure of 45.9 per cent. in 1923 to 22 per cent. in 1924.

On the suggestion of Professor F. E. Wynne, medical officer of health for Sheffield, and Professor A. J. Hall, the Sheffield Division of the British Medical Association convened a meeting representing all branches of the profession with a view to the institution of an investigation into the local epidemic; a subcommittee was formed, including Professors A. J. Hall, J. S. C. Douglas, and F. E. Wynne, and Drs. J. Clark, H. Leader, J. McKinnon, J. Russell, and H. J. Egerton Williams, Dr. A. Gurney Yates being the honorary secretary. A wider scheme of investigation was also considered, as we mentioned on December 13th, 1924 (p. 1132)—namely, the formation of a permanent advisory committee to deal with any future outbreaks of epidemic disease, and such other conditions as cancer of the breast, in which the correlation of reports of the incidence and response to treatment might result in an advance of knowledge. The subcommittee which dealt with epidemic encephalitis met under the chairmanship of Professor Hall, who, with Dr. A. Gurney Yates, took charge of the clinical side of the investigation; the epidemiological inquiry was entrusted to Professor Wynne, and the pathological work was in the hands of Professor J. S. C. Douglas.

The report of this subcommittee has now been issued by the Medical Research Council.[1] The reports on the epidemiological, pathological, and clinical aspects of the epidemic are supplemented by an appendix by Dr. J. R. Perdrau, in which the problem of etiology is considered in the light of recent researches. A grant was made by the Medical Research Council towards the expense of the pathological work.

Although the critical study of this particular epidemic and the close and prolonged observations of individual patients have not directly solved the problems of etiology or indicated the lines on which effective preventive control may be established, yet valuable information was obtained, and it is clear that further work of this kind, in which the infection is studied from all available points of view by workers acting in close collaboration, will probably achieve success in the future.

Epidemiological Report.

Professor Wynne calls attention to the difficulty of drawing conclusions from the statistical reports of such a disease as epidemic encephalitis, in which the epidemiology varies so widely and the proportion of abortive or missed cases is therefore so high. The total number of cases notified as encephalitis during 1924 was 317, but sixteen of these were proved later to have been wrongly diagnosed; this represents an incidence rate of 0.57 per 1,000 of the population. In 45 cases death occurred, giving a mortality rate of nearly 0.09 per 1,000, the case mortality being 14.9 per cent. Of the total cases 58.4 per cent. occurred in males, but the fatality rate was slightly greater among female patients, in the proportion of 15.08 per cent. to 14.77 per cent.; these figures agree with those reported in other outbreaks of which accurate figures were available. There appeared to be an increased susceptibility to infection in males between the ages of 15 and 30 years, and Professor Wynne adds that if this is confirmed elsewhere it will tend to show that there is a greater susceptibility to infection in the central nervous system of the male as compared with the female during the period when sexual maturity is attained and is most active. No evidence was obtained pointing to any relation between the disease and social conditions, such as overcrowding, poverty, or insanitary dwellings, or of any association with topographical factors, or with the supply of water, milk, or any kind of food.

Encephalitis and Influenza.

The possibility of there being some relation between influenza and encephalitis received careful consideration. So far as the comparative incidence of the two diseases since 1918 is concerned there appears to be no very obvious connexion, and 1924 was not a period of exceptional prevalence of influenza in Sheffield. In the previous year there had been a slight recurrence of influenza, but the notifications of encephalitis were only about one-half of the numbers for 1920 and 1921. A definite correlation, however, emerged during the period of prevalence of the encephalitis epidemic; influenza deaths increased rapidly from the middle of January, 1924, while encephalitis began to become epidemic some six weeks later, reaching

[1] Special Report Series No. 108. H.M. Stationery Office. 1s. 9d. net.

and the home cultivation of food, with less complete reliance on imported food products. Dame AGNES HUNT, of the Shropshire Orthopaedic Hospital, also read an interesting paper on tuberculosis, discussing the subject from the point of view of district nursing.

At the third session, under the chairmanship of the Hon. Sir ARTHUR STANLEY, the advantages of official and voluntary effort were compared. Dr. C. E. TANGYE, medical officer of health for Wiltshire, discussed the role of local authorities in an orthopaedic scheme, and related the events in his own county. While himself warmly supporting official health work, and rebutting the criticisms that it was unsympathetic, niggardly in action, and extravagant in administration, he agreed that it would be folly to ignore the freely offered services of voluntary workers, and there was also a third partner—namely, the general practitioner—without whose collaboration the best results could never be obtained in any official scheme. Mr. G. R. GIRDLESTONE of the Wingfield Orthopaedic Hospital, on the other hand, advocated the voluntary hospital and clinic, with a staff honorary or paid on a part-time basis. One advantage was that members of such an honorary staff would in the ordinary way hold specialist orthopaedic appointments at the general hospital of the district, and this would mean close co-operation between the orthopaedic and the general hospitals. One of the great drawbacks of the purely official scheme, in his view, was that when the patient was over school age, unless he was tuberculous, the doors were closed to him. There was a good discussion, but no great cleavage of opinion developed, the idea being that every means, official and voluntary, should be adopted as far as possible.

At the final session the question of the physically defective child in school was considered from various points of view. Mr. K. J. ACTON DAVIS, of the L.C.C. physically defective schools, gave the point of view of the surgeon. The aims with which he set out were: (1) to improve the physical condition of the child; (2) to produce persons capable eventually of earning their own living; (3) to protect the children from getting damaged by accidents. He also pleaded for the linking up of the welfare centres and the schools. There was a gap at present between the age at which a child was taken by its parents to the welfare centre and the age at which it arrived under the care of the education authorities, and it was in that gap that the maldevelopment was often missed.

Papers on the same subject, from the point of view of the school manager, the matron, and the teacher, were read by three ladies, and the question of the physically defective child after school was discussed by Sir MONTAGU BURROWS, chairman of Wingfield Orthopaedic Hospital. The discussions throughout the two days were very fresh and stimulating, and will be of great service to the two organizations which called the conference, but the constitution of the conference itself precluded any effective resolutions.

ROYAL SOCIETY OF MEDICINE.

THE PRIME MINISTER AT THE ANNUAL DINNER.

THE annual dinner of the Royal Society of Medicine took place at the Hotel Victoria on November 18th, when a company of 450 sat down at the tables under the Presidency of Sir JAMES BERRY, F.R.C.S. The society was honoured by the presence of the Prime Minister (the Right Hon. Stanley Baldwin), and among the other principal guests were:

Sir Berkeley Moynihan (President, Royal College of Surgeons), Sir StClair Thomson (immediate Past-President of the society), Sir Ernest Rutherford (President, Royal Society), Sir Humphry Rolleston (President, Medical Society of London), Mr. R. G. Hogarth (President, British Medical Association), the Master of the Apothecaries Society, Dr. Christine Murrell (President, Medical Women's Federation), the Presidents of the Geological Society and the Royal Geographical Society, the Presidents of the Hunterian, Harveian, West London Medico-Chirurgical, and Chelsea Clinical Societies, and Professor J. S. Haldane, F.R.S. (the Society's Gold Medallist).

The PRIME MINISTER, in proposing the toast to the society, said that he had been impressed by the extraordinary way in which all medical knowledge and practice was embraced under the single title of the society. He had read with much interest the society's calendar, and he could not help thinking how proud Sir Andrew Clark would have been had he lived to see the day when the society took its present shape, for Sir Andrew had desired to bring together the profession, for their common help in all investigations in the various departments of medicine, and to provide a common centre for the collection, co-ordination, comparison, and criticism of their respective researches. Nearly twenty years ago seventeen separate medical societies went to sleep for a moment, and when they recovered consciousness found themselves thirteen separate sections of the Royal Society of Medicine. Since then the thirteen had grown to twenty-four. The names of most of them conveyed no clear idea to his mind, though one of them struck a responsive chord, for it bore the name "Parasitology"! He compared the constitution of the society to that of the British Empire, with autonomous parts, bound together, not by a crown, but by a library, which he trusted was more interesting than that in the House of Commons.

Mr. Baldwin went on to discuss certain points of similarity between the medical profession and the profession of politics. Both professions owed a most profound debt to the Greeks. He had lately read a fascinating little book in which there was an article by Dr. Charles Singer, and it had been a revelation to him, interested as he had always been in Greek thought, to be told by a scientific man what a debt his own branch of science owed to that great and remarkable people. Dr. Singer stated that the teaching in the wards of a modern hospital was based on that of the Greeks, and that Greek medical literature was full of evidences of really fine scientific effort. To most the great Hippocrates had been only a name, but he was evidently a personality who stood to-day as he stood then for learning, humanity, gravity, and—a quality which the speaker held in the highest esteem—reticence; in these respects Hippocrates must ever remain the type of the most perfect physician. (Applause.)

Throughout his life (Mr. Baldwin continued) he had been singularly unfortunate in having seen so little of members of the medical profession. But a great deal of the doctor's work stood a close comparison with that of the politician. Both the medical man and the politician were physicians, though he preferred the medical man's patients to his own. He himself had been trying to prescribe for some time, with complete failure. The goal which they shared was a very simple one—to try to attain perfect health, involving a normal balance of the functions, a harmonious co-operation of all the organs, whether of the State or of the body. The State was an infinitely complex assembly of growing structures never at rest. The cells that composed it were always being born and always dying, but throughout the change there was a moving equilibrium of the whole. It was subject to considerable variations in temperature. Had a clinical thermometer been applied to the constitution in the early weeks of last May it would have registered a temperature of 105° or 106°, and though this had abated, there were symptoms of fever still in the body politic. A very virulent epidemic was abroad which might perhaps be diagnosed as Russian influenza. (Laughter.) It was not endemic, but epidemic, and yet epidemics lasted for a few seasons, though he believed they had a tendency to become less severe. A Harvey was wanted in the political world to find out the mysteries of the cyclical ebb and flow of unemployment. He did not think that surgery was needed, though there were people in politics who were always willing to resort to the knife, and would remove the House of Lords like an appendix. At the other extreme there were quacks and charlatans who sought to heal the sick by magic formulas, which they called slogans, exactly as the Romans used to try to set fractures by reciting meaningless phrases over the broken bones. One other thing he would say, with bated breath, that physicians, like politicians, sometimes had trouble with those members of their honourable profession who would not, or constitutionally could not, keep out of the press! This was a malady that broke out in the most unsuspected quarters. The profession of medicine had one advantage over that of politics. The medical man received emolu-

labour. Pregnancy, however, appeared to have a very prejudicial effect on the course of the disease. In the male complete impotence was not uncommon. Parkinsonism usually commenced about six to twelve months after the primary attack, and there was no evidence that the prognosis was better if it occurred early. The facial mask was the most common symptom and usually the earliest to appear; next to this came involvement of the upper limbs, in approximately equal numbers on the right and left sides. The conjugate movement of the eyes was sometimes disturbed, recurrent attacks occurring in which the eyes were involuntarily turned upwards, usually to one or the other side, and remaining fixed for a variable time, perhaps several minutes. Spasms of the jaw muscles also sometimes occurred and interfered with eating. These attacks came on without obvious cause at irregular times. Five out of 64 patients with Parkinsonism died, and of the remainder 19 appeared to be getting steadily worse, while about 23 were at a standstill. Of the 43 fatal cases in the whole series, death occurred in 40 within two months of the onset of the disease; of the remaining 3, 2 died of pneumonia several months after the primary attack, while one boy died eight months after a mild attack, which was followed by what appeared to be a recurrent acute attack with profound lethargy.

Etiology of Encephalitis Lethargica.

Dr. J. R. Perdrau of the National Institute for Medical Research contributes a short report of parallel work in London in close association with the Sheffield outbreak. He supports the contention of Levaditi and others that the causal agent of epidemic encephalitis is identical with that of herpes febrilis, except that the former has a greater affinity for the central nervous system. He admits that this theory of the herpetic origin of epidemic encephalitis is not universally accepted, though no other theory has so far been propounded on experimental grounds. A detailed account of his work was published in the *British Journal of Experimental Pathology* last year.

THE CARE OF CRIPPLED AND INVALID CHILDREN.

A joint conference under the auspices of the Invalid Children's Aid Association and the Central Committee for the Care of Cripples took place in the Great Hall of the British Medical Association House, Tavistock Square, on Thursday and Friday, November 18th and 19th. The conference, which was very largely attended, had for its general subject the care of crippled and invalid children, and in four sessions the particular phases of the subject dealt with were (1) a general survey of the work for invalid and crippled children, (2) the preventive side of cripple work, (3) the need for unity of effort on the part of local authorities and voluntary workers, and (4) the question of the physically defective child in school and after school.

Lord Eustace Percy, President of the Board of Education, delivered the inaugural address in the absence of the Minister of Health, who, as Mrs. Neville Chamberlain told the conference, was detained by his work on the smoke abatement measure, which he was pressing through the parliamentary committee. Lord Eustace Percy remarked that at most only one-quarter of the crippled children of this country were provided for in the special schools and clinics, and there were 200 areas in which no provision was at present made. The key to the whole position was the provision of new hospital accommodation for orthopaedic cases, and the main burden of such provision, though not necessarily the whole, must, he thought, fall on voluntary effort.

Mr. R. C. Elmslie, who opened the first discussion, gave a rapid survey of the work in this country on behalf of the crippled. He said that of the forty English counties practically all had been considering the formation of schemes for the care of cripples; in 13 there was as yet no definite scheme of any sort, and in the remaining 27 some sort of scheme was in hand, often, however, incomplete. In Wales the National Memorial Association had set aside a considerable number of beds for surgical tuberculosis, and Sir John Lynn-Thomas was intent upon organizing a general scheme for the care of the non-tuberculous cripple, the central hospitals being the Prince of Wales's Hospital at Cardiff, for South Wales, and the Oswestry Orthopaedic Hospital, for North Wales. In Scotland much was being done by local authorities and voluntary bodies, but there was an absence of central organization.

Mr. Harry Platt of Manchester followed with some account of what is being done in America and on the Continent. He described particularly what is known as the Vermont organization in America for the early treatment of infantile paralysis in epidemics. This organization, he said, included adequate measures to control the spread of infection, and the institution of early treatment for children who showed actual paralysis, with the establishment of special clinics in infected areas, and arrangements for home visitation and for operative treatment in hospital.

Sir Robert Jones, Bt., chairman of the Central Committee for the Care of Cripples, in speaking of future developments, described at some length the work of that organization in the directions of prevention and cure. He said that the national scheme included the provision of open-air orthopaedic hospitals, with expert staffs and modern equipment, and, surrounding these, orthopaedic clinics in the smaller towns, by which it was hoped to ensure continuity of treatment. He advocated an intensive publicity campaign, especially with the object of making it known that tuberculosis and rickets were preventable, that crippling diseases were not hereditary, but acquired and gradually progressive, and that generally they were curable by well organized, early, skilful, and thorough treatment. Future developments should not disregard the claims of the adult cripple. At present if the cripple was over the age of 14 or 16 it was next to impossible in this country to afford him adequate help. The desire to help and the requisite knowledge were available, but the facilities were absent. The adult cripple had a right to expect from the State equally considerate treatment to that which was given to the child, and beds should be available for him. Sir Robert Jones pleaded for more optimism with regard to this whole subject, and an end to the despair and consequent lethargy which had shrouded it.

Dr. Veitch Clark of Manchester said that 33 per cent. of children had some defect on entering school, not always, of course, of the crippling variety, but leading very often to incapacity, partial or complete, later on. In Manchester last year he received notification of about 500 new cases of tuberculosis in children under 15 years of age, at least one-half of them of the surgical type. The conditions which produced rickets also operated most seriously in the great industrial centres. Dr. Alfred Greenwood described the successful inauguration of a scheme which, as medical officer of health for Kent, he had brought forward in that county, and the way in which he had allayed certain misunderstandings among the local practitioners who were a little distrustful of what they regarded as a new special service.

At the second session papers were read on rickets, on rheumatism, chorea, and heart disease, and on tuberculosis from the preventive point of view. Dr. Stuart J. Colwell of Sheffield, in discussing rickets, said that it had been stated that rickets was a rare disease in London, but recently published statistics hardly bore out that optimism, and certainly in most industrial centres this crippling disease was still rampant. The measures of treatment were a proper supply of antirachitic vitamin, and, alternatively, or in addition, treatment by ultra-violet radiation, and, of course, attention to general health. Dr. Arbour Stephens, chairman of the Swansea Education Committee, said that there were from 80,000 to 100,000 cardiac cripples under 14 years of age for whom little or nothing was being done. Bad feeding and malnutrition were the predisposing causes. A family history of bad cookery was of far more serious import than a family history of supposed hereditary rheumatic disease. Cardiac cripples could be treated to the best advantage, alike physically, mentally, and economically, in conjunction with orthopaedic cripples. The ultimate solution of the problem of prevention was bound up largely with the land problem

scientific man or woman who has made valuable contributions to the science and art of medicine. It was the gift of the late Dr. Murray Leslie, and the first award was made in 1921 to Sir Almroth Wright. The medal bears on its obverse a representation of Hygeia, daughter of Aesculapius, bestowing a wreath upon Research, while the reverse represents Cheiron teaching Aesculapius the art of healing.

Dr. HALDANE, after thanking the Council for the bestowal of the medal upon himself, said that though his life had been given to physiology he had never failed to retain a keen interest in clinical medicine. As a physiologist he had very early in life discovered that the best subject of experiment was a human being, and that of human beings the best subject was either oneself or a brother physiologist.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

LORD BALFOUR AT THE ANNUAL DINNER.

THE annual dinner of the Royal Society of Tropical Medicine and Hygiene was held at the Hotel Victoria, London, on Monday, November 22nd. Dr. ANDREW BALFOUR, President of the society, was in the chair, and the principal guests were the Earl of Balfour, K.G., O.M., the Hon. W. Ormsby-Gore, M.P. (Parliamentary Under Secretary for the Colonies), Sir Joseph Cook (High Commissioner for Australia), Sir John Rose Bradford (President, Royal College of Physicians), Sir James Berry (President, Royal Society of Medicine), Sir John Bland-Sutton, Sir Walter Fletcher (Secretary of the Medical Research Council), Surgeon Vice-Admiral Sir J. Chambers (Medical Director-General, R.N.), and Lieut.-General Sir Matthew Fell (Director-General, A.M.S.). The company of 200 was representative, not only of tropical medicine, but of all branches of medical science.

The EARL OF BALFOUR, in proposing "The Royal Society of Tropical Medicine and Hygiene," referred to the problems presented to the country by the tropics, in which the expert and the inexpert alike were deeply interested. Looking at the problems from their national and imperial aspects, he was profoundly struck by the growing closeness of intimacy between all forms of human activity. Not many years ago the spheres of human activity were separate; in practice the man of science was either a physicist, an astronomer, or a chemist; the word "biologist" had not become fashionable at that time. A doctor who was a man of observant habits visiting Africa, for instance, came back with much useful knowledge, but things were not considered in their interrelation. If everything had to be regarded in the light of modern knowledge, interconnected and getting more and more interconnected every day, how were problems of such increasing complexity to be dealt with? Anyone who followed what had occurred at the Imperial Conference would agree that the section which had had entrusted to it the consideration of such problems showed the keenest appreciation of the need for growing intercommunication in all scientific branches of study. One important problem was that of the tsetse fly in Africa. It was an appalling reflection that, looking back over the history of mankind, people should have to say that the greatest of all prehistoric discoveries, the discovery or creation of the domestic animal, over a vast area of Africa was rendered impossible because such animals could not be used for transport owing to the all-conquering tsetse fly. It had been said by our ancestors that man was the crown of creation, but man was having a very hard fight of it with organisms which were certainly not the crown of creation, and it was not perfectly clear to him as yet that man was getting the best of the fight. There were aspects of medical science which almost indicated that at the present moment the battle was not going in favour of the superior animal. If that was true what was needed was a combination of all branches of science, and the work of a society such as this was a necessary part of the machine. A man who took a medical degree and went out to a remote part of the Empire found himself face to face with tremendous problems, not only strictly medical problems, but also problems of anthropology, which could not be ignored by anyone who tried to deal with the native races. He found himself forced by his own sense of the necessity of the situation to do research, while at the same time often overloaded with routine work. He discovered very few companions who either understood the objects for which he was working or his methods, and therefore the society was of immense advantage to him, not only by furnishing him with its transactions, but because he could feel himself part of a great machine which was attempting to deal, in a broad spirit, with all these problems, and that when he came home he would find in the society those who could help him in his troubles. Lord Balfour wished the society long life, great success, and an increased sphere of usefulness.

In replying to the toast, Major E. E. AUSTEN, of the Department of Entomology in the British Museum, made a strong plea for funds to enable the society to have a house of its own in London, and so develop its activities in a way which it could not do now in its cramped temporary abode.

The toast of "Britain in the Tropics and its Defenders" was proposed by the Hon. WILLIAM ORMSBY-GORE, M.P. He said the outposts of the Empire, the Dominions, and Colonies, stretching from the torrid zone, had ever before them the special problem which interested the workers associated with this society. But it should be remembered that the British Empire would never have existed, and could not exist, were it not for the physical defenders typified in the other guests who were to respond to the toast. In the past our young men went out to the tropics carrying their lives in their hands, and even to-day the odds were not quite what they ought to be, and the risks were great both to health and life. It was being realized to-day that the health of our garrisons, of our civil servants, and of traders in the tropics could not be maintained, apart from the health of those teeming millions who were living in those countries. Where problems of science and disease had to be considered it was not possible to draw national boundaries. The health of the British in the tropics was bound up with the health of their coloured fellow-subjects. Britain would never bring to the use of civilization and to the advancement of mankind as a whole the enormous resources of the tropics unless she could forward in quality of civilization and in health the interests of these coloured peoples. The task was only just beginning. It was due to the teachings of Manson and Ross that it was realized that garrison service was not enough, that the duty of Britain in the tropics was to the whole population. Above all, what was wanted in the great fight of man against insect was speed and mobility. Delay was dangerous, and foresight essential. What was needed in the tropics was the application of science, science, and more science. It was necessary to take a long view, such as the navy took when they said they were going to lay down a programme for many years ahead. The great fault in the past in dealing with British tropical possessions had been timidity, the short view, and the neglect of science. We had the greatest tropical Empire the world had ever seen, but it was difficult to get people to realize it.

Sir JOSEPH COOK, in reply, referred to the situation in Australia and the Pacific, and said that the problem of civilization in the tropics seemed to him essentially one of health, and if that were solved economic problems were solved straight away. Nothing hindered economic success in the tropics but the question of disease and insects, and he wondered whether it would not be possible to develop a type of manhood which would acclimatize itself to the tropics of the world.

The toast was replied to also by Sir JOSEPH CHAMBERS, who paid tribute to the successes of the professors of tropical medicine in London and in other places, and also to the work of the great Colonial Secretary, Joseph Chamberlain. Lieut.-Colonel W. P. MACARTHUR proposed the toast of "The Guests," which was responded to by Sir JOHN BLAND-SUTTON, who thought there had been a slight mistake in labelling the toast "Guests," because in such a society the toast should have been "Hosts and Parasites"! "The Chairman" was proposed by Sir MATTHEW FELL, who paid a tribute to the work of

ments appropriate to the confidence reposed in him by the public, but the politician did not. If any politician did, his salary would vary remarkably with events and seasons.

"One other personal confession I should like to make," said the Prime Minister in conclusion. "I have sought some medical assistance in the course of the year, and I should like to give you my own experience. I expect you all know your Samuel Butler pretty well, and you may remember the physician in *The Way of All Flesh*, who prescribed for Mr. Pontifex—whose symptoms somewhat resembled mine, he was feeling tired—a course of the larger mammals at the Zoological Gardens. This physician, 'one of the most eminent doctors in London,' said:

"'I have found the Zoological Gardens of service to many of my patients. I should prescribe for Mr. Pontifex a course of the larger mammals. Don't let him think that he is taking them medicinally, but let him go to their house twice a week for a fortnight, and stay with the hippopotamus, the rhinoceros, and the elephant, till they begin to bore him. I find these beasts do my patients more good than any others. The monkeys are not a wide enough cross; they do not stimulate sufficiently. The larger carnivora are unsympathetic. The reptiles are worse than useless, and the marsupials are not much better. Birds again, except parrots, are not very beneficial; he may look at them now and then, but with the elephants and the pig tribe generally he should mix just now as freely as possible.'

"During the long and weary months of the coal stoppage I more than once escaped into Regent's Park, and became aware of a feeling which I had not experienced during my conferences—in Mr. Pontifex's own words, I received an influx of new life, or derived new ways of looking at life, which is the same thing. I found the doctor quite right in his estimate of the larger mammals as those most beneficial. As for the elephants, especially the baby elephants, I seemed to be drinking in large draughts of their lives to the recreation and regeneration of my own. I mention this in the hope that one or other of my hearers may find the hint useful."

Mr. Baldwin then gave the toast, saying what profound respect he had for the medical profession—a profession in which more was freely given to the people of this country out of the largeness of its heart and out of its wisdom and experience than from any other profession in the world, and those who rose up and called it blessed were beyond all enumeration.

Sir STCLAIR THOMSON then invested the President with a gold chain of office which he presented to the society. It was, he said, some three hundred years old, of the Elizabethan period, and doubtless wrought by some Italian artist, some Benvenuto Cellini of the Renaissance. He had had the benefit of the expert advice of the South Kensington Museum and of his friends Sir Frank Dicksee and Sir George Frampton, who had agreed as to its period and its artistic value, and that it was worthy of being offered to the Royal Society of Medicine, and the Council had honoured him by accepting it.

Sir JAMES BERRY expressed thanks to the Prime Minister for the felicitous terms in which he had proposed the society's health, and to Sir StClair Thomson for the valuable gift of one of the most beautiful chains in London. The chain would serve to remind them of their immediate Past-President, whose generosity was equalled only by his brilliance and wit. Sir James Berry then gave some account of the work of the society during the year. Many useful discussions had taken place, and improvements had been made in the internal arrangements of the society's house, especially by the provision of a new epidiascope (or episcope, as the makers called it), superior to any instrument of the kind hitherto known. The balance of the money subscribed as a memorial to the late secretary, Sir John MacAlister, had been expended on its purchase. Sir James Berry also referred to the value of the society's library, and in view of the lending and other facilities offered by the library made an appeal to general practitioners, especially those in the provinces, to become Fellows. He concluded with a few words on the present state of surgery. One of the many evil after-effects of the war was that a great wave of well-meaning enthusiasm for operative surgery had spread over this and other countries. Many difficult and dangerous surgical operations were being too lightly undertaken by those whose training, experience, and judgement were insufficient, and who were not devoting themselves exclusively to the practice of surgery. Those who were behind the scenes in the surgical world saw only too much of what was going on. Successful major operative surgery in civilian practice must depend upon a solid foundation of pathological anatomy and clinical experience. The limited field of war surgery, necessarily concerned mainly with the surgery of injuries in more or less healthy individuals, was in itself alone but an indifferent school for the surgery of civil practice. The only remedy for this state of things was an increase of knowledge among would-be operating surgeons. One way of obtaining this increase of knowledge would be by joining the Royal Society of Medicine, attending as often as possible the debates and demonstrations, and making full use of its library.

The only other toast was that of "The Guests," which was proposed by Dr. ROBERT HUTCHISON. In a happy reference to the Prime Minister Dr. Hutchison said that Mr. Baldwin might have been even more in his element as a country doctor than as a politician. He would not have made a good specialist—he was too honest for that!—but with his love of the country and of country people and things, and his sympathy for the common man, he would have made an ideal country practitioner. He coupled with the toast the names of Sir William Bragg, Fullerian Professor, Royal Institution, and Sir Berkeley Moynihan, describing the latter as a sort of surgical "Pooh-Bah." Sir Berkeley, he said, must find it, as President of his famous College, somewhat of a bore to attend so many official dinners, but in his private capacity it must afford him a certain satisfaction to see laid broad and deep before his eyes the foundation of those dyspeptic disorders which brought so much grist to his mill. (Laughter.) In Yorkshire, a county whose people were supposed to be somewhat addicted to the pleasures of the table, they had two gifts of Providence—the waters of Harrogate and Sir Berkeley Moynihan. If the first failed, the best they could hope for any patient was that he might fall into the arms of the other.

Sir WILLIAM BRAGG said that it was the greatest happiness of any man doing research work in science to feel that he was of any help to those who were responsible for the health of the nation. Science on his side had to thank medical men for assistance. Indeed, medical men and scientific men—that is, chemists and physicists—had been in partnership for the last 250 or 300 years. They were, so to speak, boys together during the last half of the seventeenth century, when the times were full of scientific experiment, when wonderful theories were abroad, and when the Royal Society was founded. In these days, when it was possible to look more deeply into Nature's secrets than ever before, he hoped that they might still render one another great service.

Sir BERKELEY MOYNIHAN took up Dr. Hutchison's allusion to him as "Pooh-Bah," and amusingly pictured himself occupying the various offices of that distinguished gentleman, and said what he would do in each, until at last he recalled that Pooh-Bah was also commissioner of police, and in the exercise of that office he arrested himself for loitering. Sir Berkeley Moynihan went on to pray for a closer understanding between the lay public and the members of the medical profession. Theirs was not a gregarious profession, and they were apt to be silent under attack. But they were wounded in the house of their friends when those who knew them took distorted views of their work and ideals. How little they were sometimes understood was shown in the earlier months of this year when the profession was bitterly assailed in private speech and in the public press. Prejudice seemed then inordinately bitter against them, but prejudice was nothing but the emotional reaction of ignorance to truth, and truth in the end had a way of surviving. But he pleaded that members of the profession should do all in their power to present the plain truth acceptably to the public on due occasions, to play a larger part in municipal and national affairs, and to endeavour to saturate public life with the ideal of service and sacrifice.

The last event of the evening was the presentation of the Gold Medal of the society to Dr. J. S. Haldane, F.R.S. This medal is awarded every five years to a

absorbed in tuberculosis. Dr. Black Jones, M.O.H. Builth and Colwyn, stated that he did not institute legal proceedings against farmers under the Milk and Dairies Acts. His method was to teach, explain, and advise, and then to publish reports of the producers who had reached a proper standard. The results had been excellent. Dr. Nathan Raw described the success of compulsory pasteurization of milk in America, where, he thought, no doctor would in future have any experience of non-pulmonary tuberculosis in children. At all events, ten years of pasteurization of milk were stated to have eliminated these diseases in New York; it appears, however, that 6 per cent. of the Washington butter contains tubercle bacilli. Dr. W. G. Savage had apparently been prevented on previous occasions from replying to those who think that bovine tuberculosis confers immunity on children because the bovine bacillus is less virulent than the human. The evidence, said Dr. Savage, showed that the bovine bacillus was really the more virulent; its apparent innocuity was due to the fact that it was ingested—a different and more resistant path. At the afternoon session Mr. Neville Chamberlain recapitulated information for the benefit of a wider audience. The rest of the afternoon was devoted to a rather desultory discussion on various proposals for amending, defining, extending, and strengthening milk Acts and regulations. Many will be found to agree with Mr. Wilfred Buckley in condemning the deceptive title "Grade A" as applied to milk. Some amusement was caused by a representative who wondered how many of the audience had tried to milk a cow under really cleanly conditions. On the whole, we think that the National Clean Milk Society might wisely abandon its love of conferences, and devote its energies in two directions—first, to promoting knowledge among producers and distributors, and secondly, to striving by research to obtain answers to the many disputed questions connected with milk.

Cost of Tuberculosis Treatment.

The Ministry of Health has issued a memorandum (122/T) showing in tabular form under various heads the cost per patient per week at certain residential institutions for the treatment of tuberculosis in England and Wales. The period under review is the year ended March 31st, 1926. The tables have been compiled on the same lines as in former years, and for purposes of comparison the corresponding figures for the previous two years have been inserted. The information thus set out is circulated in the hope that it may help the authorities concerned to decide whether in a given case the items of expenditure are on the lowest possible level compatible with efficiency. Analysis shows that in rather more than half the institutions for which comparative figures are available, the total cost per patient per week has increased, in some cases considerably, and that in a number of these the percentage of beds occupied to beds provided has diminished. Since full value for the expenditure incurred at a residential institution can only be obtained if all the beds are occupied, the Ministry asks local authorities to do their best to keep their beds filled to the greatest possible extent. Another matter to which attention is drawn is the proportion of staff to beds for patients; it appears to the Ministry that in some institutions "this question should continue to receive careful consideration."

Royal Dental Hospital and School.

The staff and past and present students of the Royal Dental Hospital and School dined together at the Trocadero Restaurant on November 20th, under the chairmanship of Mr. W. H. Dolamore. Among the guests were several leading members of the dental profession in London and the provinces. The Chairman, in recalling the history of the school, said that the name of John Tomes was ever to be connected with its origin. He represented British dentistry in a sense which was scarcely true of any other one man, and he was the moving spirit in the foundation of the school. Speaking as a member of the Dental Board, Mr. Dolamore said that the Board's concern for professional progress was heartily supported by men who came on the *Register* under the Act of 1921 as by those who were there through qualification, and as a result of the efforts initiated by the Board the movement for dental education was going forward, existing schools were being better equipped, and new schools would be opened. He looked forward to a large increase of dental students, notwithstanding a temporary decline due to passing causes. Mr. J. H. Badcock, past-president of the British Dental Association, whose name was associated with the toast of the school, spoke of the school as the mother of dental schools, with her children in every part of the British Empire. He also referred to the entrance of women into the profession; their excellent work already had fully justified the broadminded policy of the governors in admitting women to the hospital. Mr. Badcock gave some advice to those just entering dental practice—to join a defence union, to insure against accident and illness, and to become members of the British Dental Association. Further responses were made to the toast by one of the prizemen, Mr. M. Lewis, and by the dean of the school, Mr. H. Stobie, who gave an account of recent changes in the staff and other matters of domestic interest. Mr. A. L. Packham proposed the health of the guests, and the toast was responded to by Professor T. B. Johnston of Guy's, and the proceedings closed with compliments to the chairman, voiced by Mr. Norman G. Bennett, and warmly endorsed by the company.

Scotland.

Henderson Trust Lecture.

A public lecture under the William Ramsay Henderson Trust was delivered on November 12th by Dr. R. D. Clarkson, M.D., F.R.C.P.E., in the anatomy classroom of Edinburgh University. Dr. Hamilton C. Marr, Senior Commissioner of the General Board of Control, presided. The lecturer took as his subject "Some types of mental defectives," and said that in the popular mind three grades of mental deficiency were recognized. Over fifty years ago the lecturer's predecessor in the post of medical superintendent of the Royal Scottish National Institution at Larbert had suggested a classification under twelve types. The Mongolian type had been first distinguished in 1866 by Dr. Langdon-Down, who had been struck by the small broad head of these cases, which produced a Chinese cast of features. None of the tissues of these persons were normal, their ligaments were extraordinarily lax, so that many could sleep quite comfortably with the head between the feet, and as they grew older they never attained to the normal facility in the use of their limbs. There had been a belief that these were reversions to a forgotten ancestral type, and Dr. Crookshank had written a book, *The Mongol in our Midst*, in which it was made to seem probable that mankind had risen from at least three separate stems, so that there were affinities between the Mongol and the orang, between the negro races and the gorilla, and between the white races and the chimpanzee. This theory was negatived if the mental state of the Mongolian defectives were examined. They were placid, easily pleased, confiding, and gentle. They were incapable of forming abstract conceptions, and therefore never got any clear idea about their environment. They had a strong sense of rhythm, and were fond of music. A few of those who reached school age had very low intelligence quotients, and the majority were in the imbecile class. The highest of them might learn to read and write, but were very defective in arithmetic, and had to be cared for as children all their lives. It was fairly certain that if an ancestral branch of the human race had had such characteristics, it must have died out very soon and left no descendants. The simple primary defectives formed a less definite class and were regarded as degenerates. Stigmata of degeneracy were said to be very numerous, but every one of the physiological and physical stigmata, such as the deformed palate, malformed ear, and so on, might be found in quite normal people. The lecturer had grave doubts as to there being evidence of a degenerative tendency, although it was a fact that the bodies of idiots were seldom well formed. As in the bodily state of the simple primary cases there was no definite evidence of any one morbid

Dr. Andrew Balfour, especially in connexion with the Advisory Committee that visited Mesopotamia in 1916. The Chairman, in responding, referred to the good work done for the society by its honorary secretaries, Dr. Wenyon and Lieut.-Colonel Clayton-Lane.

Canada.

[From Our Special Correspondent.]

Tuberculosis in Canada.

During the present year great activity has been shown in connexion with tuberculosis. Some figures of a general nature may be of interest. Canada is made up of nine provinces, whose population in 1925 was 9,352,000; all the provinces possess regular death registration bureaus. In 1925 the total number of deaths from pulmonary tuberculosis was 6,257, and in the same year, for all forms of tuberculosis, 7,468. The death rate for tuberculosis per 100,000 was 79.8; the corresponding rate in 1924 was 83.28. This is a record which may well cause gratification, especially when it is recalled that at the time of the organization of the Canadian Association for the Prevention and Treatment of Tuberculosis, in 1901, the death rate from tuberculosis was 180. Acknowledgement is made, however, of influences both from Great Britain and the United States, the most recent being the visits by Sir Henry Gauvain and Professor Lyle Cummins. These two outstanding authorities addressed medical groups of eight provinces, and I can testify to the interest with which they were followed. Professor Cummins, in particular, brought out his experience in connexion with sanocrysin. Work in the maritime provinces (Nova Scotia, New Brunswick, and Prince Edward Island) has been given an extra stimulus by a gift from the Canadian life insurance companies of 45,000 dollars. The degree to which the Provincial Governments are ready to co-operate with the various provincial tuberculosis leagues is one of the most encouraging features of the situation; in New Brunswick, for example, there are hopes that the Provincial Cabinet will give its sanction at an early date to the addition of sixty-five beds to the Jordan Memorial Sanatorium. The Sanatorium Commission has over 100,000 dollars available for this work, but the Government's approval is required, because the Government becomes responsible for the increased maintenance. A committee from the Cabinet has visited the sanatorium, and has instructed the architect to revise the proposed plans. The medical profession of the province entirely support the tuberculosis movement, and many of them in the rural districts personally see that their municipalities provide institutional care for needy cases.

In Nova Scotia the Tuberculosis Commission has been granted 10,000 dollars by the Government for this year, and the money is being used to provide an extra diagnostician, a secretary, and a bacteriologist. The press has been giving hearty support, and the profession generally is entirely in accord with the plans. One of the first moves was made by the agricultural group, whose aim it is to rid the province of bovine tuberculosis. To this end an education train traversed the province last summer with exhibits and literature, and carrying speakers on the subject.

A special study is being made by Professor H. W. Hill of conditions among the Indians in British Columbia, the association having been given a grant for this purpose. The statistics for tuberculosis in this province have been showing in the last four years a grave increase, especially in comparison with other provinces, but it has been pointed out that this is due chiefly to the increasing percentage of deaths registered among North American Indians. In 1924, for example, they contributed 24 per cent. of tuberculosis deaths. Dr. Hill's work, therefore, is of great importance. The field covered by him is very extensive, and his report should be interesting. Apparently, sources of tuberculous infection are not hard to find, but cow's milk is not an important factor, as it is not used at all. Dr. Hill, in addition to his researches, addresses the Indians, and in some instances has induced them to vote as to the methods of care they favour.

Resentment against Liquor System.

A forcible protest has appeared in a recent issue of the *Nova Scotia Medical Bulletin* with regard to the control of liquor in that province. The ground taken is that the profession has been imposed upon (he speaks colloquially of "being made the goat"!) by the local Government, in being made the sole medium through which the public can obtain their supplies of spirits. He describes the all too familiar scene of streams of visitors at his office, each one pulling out his dollar fee and making the laconic demand "Scrip, Doc." It is, he says, to be deprecated that money could be made out of it—even, if so desired, large quantities of it. However, those apparently acute troubles are over, since supplies of alcoholic liquors are much more freely obtainable from "bootleggers," leaving the doctors fewer prescriptions to write. But further aggravation has been caused by the recent instructions from the Liquor Commission to the medical profession making it necessary for those issuing prescriptions to make affidavit every quarter of the number issued. The point is well taken. It illustrates one of the less obvious results of prohibition. Each province in Canada has its own method of controlling the sale of liquor, and it is to be presumed that each separate plan is the expression of the majority's desire, but there seems to be little doubt that the method of controlling the sale in the province of Quebec is producing the most orderly distribution. There is in Quebec a Government liquor commission at whose shops alone liquor may be obtained (with the exception of licensed establishments for beer and light wines), and this relieves medical men of having to make special prescriptions for alcohol, with all the undesirable features that this involves. The profit made by the province is naturally high—enviably so in the eyes of some other provinces; but certainly no more excess is seen in this province than in those with complete prohibition of alcohol.

Rabies in Quebec Province.

An outbreak of rabies occurred in the region of Ottawa last winter, initiated by the bringing of two infected dogs from the State of New York. In spite of the prompt measures taken by the health authorities, the disease reached the island of Montreal. The efforts made to control its further spread from here were at first extremely vigorous; a muzzling order was issued, and thousands of stray cats and dogs were destroyed on the streets. The fact also that the bridges from the island could be watched to prevent dogs being taken off the island made the control of the infection fairly simple. Clinics were established at the city hospitals for providing antirabic treatment, and most dog-bites, of any type whatever, were treated there as a routine. No human deaths have been reported. It is hoped that with the advent of the winter the infection will be eventually stamped out, but the provincial health authorities quite realize how stringent and prolonged the precautions must be. Considerable numbers of infected cattle have had to be destroyed.

England and Wales.

A Milk Conference.

Milk in relation to public health was the subject of a conference convened by the National Clean Milk Society, and held in London on November 16th. It was announced that some thirty-four organizations, including the British Medical Association, supported the conference; and the Minister of Health, Mr. Neville Chamberlain, presided at the earlier part of the afternoon session. Notwithstanding these distinguished auspices, and a very good attendance at the meetings, it was hard to discover much that was new in the speeches. It was noticeable, perhaps, that the supporters of pasteurization appeared to outnumber the advocates of clean raw milk, thus reversing the position taken up at the discussion in the Sociological Section of the British Medical Association's Annual Meeting at Bath in 1925. At the morning session, in the discussion on Dr. Harriette Chick's paper, the attention of speakers was almost entirely

months, January 1st, 1925, to February 28th, 1926; the amount collected during the year 1924 was £26 13s. Donations amounted to £31 10s., being life membership donations from Dr. Alfred R. Parsons, £21, and Dr. Thomas G. Stevens, £10 10s. The Irish Medical Association contributed £10 and the Dublin Clinical Club £5 5s. Two legacies were received. The late Dr. William Hennessy of Galbally left to the trustees of the Fund the sum of £100 for the purpose of providing an annuity of £5, or whatever that sum invested produced, for the benefit of widows or orphans of medical men, and the late Mrs. E. Thompson of Kingstown bequeathed £100 to the Fund; thanks were expressed to Dr. T. Hennessy, T.D., and to Mr. Herbert Dudgeon, the executors of these respective estates. These sums, together with a further sum derived from recovered income tax, have been invested in War Loan 5 per cent. stock, 1929-47, to round off the holding in that security at the even figure, £4,000. The Osborne fund being still in debt to the general fund, no grants have been charged against it; the debt has now been reduced to £4 9s. 2d. The committee points out that while receipts from dividends and interest during the past year amounted to £1,079 4s. 11d., the normal income from subscriptions was only £646 2s. 6d., and this, it was considered, afforded a rather remarkable contrast between the contributions of the dead and those of the living; while recognizing with gratitude the liberality of those who subscribe, it deplores the fact that so many contribute nothing. Could the mass of the profession but realize how much the grants of the society mean to the recipients—comforts otherwise beyond their reach, clothes for themselves or for their children, and in some cases the very essentials of life itself—the committee believes that the number of supporters would materially increase. It asks those who know the society's work to canvass their colleagues who are not subscribers, so that the field of support may be extended and the financial stability of the Fund increased.

Medical Inspection of School Children.

Dr. E. F. Stephenson, chief medical adviser to the Department of Local Government and Public Health in the Irish Free State, in a statement to the *Irish Independent*, announced that local authorities, in consultation with the newly appointed county medical officers of health, will prepare and submit draft schemes for school medical inspection for the approval of the Minister. The county medical officers of health when appointed will make preliminary surveys of the schools to ascertain the state of the general physique of the children and to estimate the standard attained in the different schools by children of approximately the same age. The school medical service should include the supervision of health, cleanliness, nutrition, and physical upbringing of each child, and should provide for periodical medical and dental inspections, with a view to preventing disease in the whole child population of school age. The regulations required general inspection of the children, special examinations of each child at specified age-periods, and careful investigation of defective children, followed by treatment. The inspections would be performed, where possible, in a room set apart for the purpose. It was intended to utilize the existing hospitals as treatment centres, and to employ the nurses engaged by district nursing associations, thus encouraging voluntary effort. In several cases special clinics, especially dental clinics, would be required. All the necessary institutions existed in Dublin, and the scheme there required practically no new machinery. The staff in each area would consist of the school medical officer, dentists, nurses, and, in large areas such as Dublin, an assistant medical officer. By co-ordinating with the scheme the nurses employed in maternity and child welfare work overlapping would be avoided and the health of the children would be supervised from birth to the time they left school. Dr. Stephenson added that there was no intention of rushing an elaborate and costly scheme on the country. No coercion would be employed, and a grant would be made to defray half the net cost of the approved schemes, payable in three instalments in the same way as the tuberculosis grant. Schemes on these lines in Cork and Clonmel were developing satisfactorily. A general survey of Cork had shown the need for such a scheme. Of the children examined, 69.9 per cent. were found to have defective teeth, 19.5 per cent. defective sight, 6.8 per cent. nose and throat troubles, and 9.4 per cent. minor ailments. Uncleanliness was present in 11.8 per cent., and malnutrition in 8 per cent. All these children were being treated at appropriate centres. Treatment under the scheme would be limited to certain common ailments which permitted of more or less direct remedies—for example, defects of the eyes, ears, teeth, enlarged tonsils, adenoids, minor ailments, and uncleanliness. More serious cases, such as orthopaedic and spine cases, would be referred to the local authority.

India.

[From our own Correspondent.]

Cholera in Madras.

A special study of the epidemiology of cholera is being made in Madras, and in his annual report for 1925 Major A. J. H. Russell, I.M.S., the director of public health for the Presidency, states that three papers on the subject are in the course of preparation. Colonel King, who was sanitary commissioner in Madras during part of the last decade of last century, asserted that where both the north-east and south-west monsoons affected a district its chief cholera season would follow its chief monsoon. This observation has been related to the conditions during a series of years, and it has proved substantially correct. In addition to this annual periodicity associated with the monsoons recent investigations have revealed a tendency for cholera epidemics to show violent exacerbations every seventh year. In 1918 nearly 123,000 deaths were recorded, and it was consequently anticipated that the incidence of cholera in 1925 would again be high. Preparations were therefore made, and although the forecast proved substantially accurate the mortality during 1925 was less by 7,000 than that of 1924, and only about one-third of that recorded in 1918. This indicates the value of the systematic preventive work in the infected districts, which was often carried on under considerable difficulties. In a special report submitted to the Government in 1872 the then sanitary commissioner, Dr. Cornish, concluded that cholera had no endemic centre in the Presidency of Madras, and that each fresh outbreak of the disease was due to waves of invasion from Bengal, either through the Bombay Presidency or the Central Provinces and Hyderabad. Recent investigations have, however, proved that these hypotheses were unsupported by facts, and that there are many endemic foci in the deltas of the large river basins in the Presidency. In each serious epidemic the first cases always appear in the same centres, and indisputable evidence exists to show that the infection spreads from these foci along the rivers and canals. The outbreaks arising in the delta areas of the Presidency are characterized by chronicity, whereas in other regions they are short and explosive. Certain districts are also in constant danger of invasion by cholera from neighbouring territories, such as Hyderabad and Pondicherry. Until recent years fairs and festivals played a prominent part in the dissemination of cholera, but since the introduction of the district health scheme considerable attention has been paid to the sanitary arrangements at these centres, and outbreaks of the disease are now exceptional. This prevention of cholera outbreaks associated with fairs and festivals necessitates also the taking of measures to safeguard the health of the pilgrims on the main routes leading to and from them. The importance of this, it is added, has not yet been sufficiently recognized, and severe cholera outbreaks have consequently resulted. Major Russell urges that the grants for rural water supplies made by the Government to local bodies should be so allocated as to improve and protect the sources of water lying along the main routes radiating from the festival centres. The efficacy of anti-cholera vaccines, both Haffkine's and

condition at work, so in their mental state every conceivable variation was found. It was quite common to find cases with sufficient intelligence to get on in life, but so defective in temperament that they failed. No test yet devised would detect these cases, and life was the only acid test for the certain detection of mental defect. Among the higher-grade defectives there were some whose defect was almost certainly the result of improper education. The growth of the mind was the result of innumerable reactions between the nervous system and its environment. If wrong reactions were formed into habits by constant encouragement, a child that might have passed as normal might revert into the defective class. The most important part of education was the building up in the years when the brain was growing fastest before the school life began. As yet there were not nearly enough special schools for children who were backward in development; further, it must be ensured that the good which was done to a child in such a school was not undone in the home or on the way home. No system of education, however, would bring the lowest grades up to normal, and these must continue to be a burden on the community. He considered, however, that all defectives should be prevented from having children; for, apart from the risk that their children might inherit mental defects, which was possibly exaggerated, it was certain that no child of a defective could have a fair chance of growing up to be a useful citizen, unless it was brought up by someone else. It was to be hoped that before long the community would make better provision for the defective and that diagnosis and treatment would be more successful than had been possible in the past.

Chemistry and Biology.

At a meeting of the Pharmaceutical Society, in the Society's Hall, Edinburgh, on November 19th, Professor J. Arthur Thomson, Professor of Natural History in the University of Aberdeen, gave the inaugural sessional address on "Chemistry in the service of biology." He spoke of the fundamental contributions to this subject to be found in the work of Lavoisier and Liebig. The former had introduced the idea of life as combustion, the latter had an equally important concept in regard to the circulation of matter. Important steps forward with far-reaching consequences had been made by Wöhler in the synthesis of urea, which had broken down the wall between organic and inorganic chemistry, and by Pasteur, whose chemical researches had appreciated the manifold activities of bacteria and foreseen the important role of fermentation in vital processes. One of the most important processes in the world was the synthesis that goes on in the green leaf under the action of light. There had been a long chain of discoveries in this subject from Priestley onwards. At the present day no one could do much in regard to the biology of the cell unless he was familiar with the properties of colloids. A recent instance of the invaluable services of chemistry to biology was found in the importance to muscular activity of glutathione, a substance discovered by Sir F. G. Hopkins. Services to embryology might be illustrated by Werber's experiments on the role of butyric acid in the production of monstrosities. The study of the nature and origin of organic pigments had been of great use in regard to the elucidation of biological problems of concealment, advertisement, or decoration. The modern work on the specificity of proteins had verified the old saying that all flesh was not the same flesh. It was possible that recent means of distinguishing by chemical tests between the blood of a male and a female animal might lead to discovery of the metabolic difference between the sexes. Indeed, all the descriptive sciences were bound to come more and more closely into co-operation in describing the nature and being of living things.

Periodic Medical Examination.

An address on factory legislation was delivered on November 18th to the Unionist Workers' League by Dr. W. Robertson, medical officer of health for Edinburgh. Dealing with the Factories Bill of 1926, he said that there had been a tendency to do too much by legislation, and that the individual should take a share in the general levelling-up process that was going on. Among the most clamant needs of the moment, however, was the establishment of a universal scheme for periodical medical examination of employees. Prevention was a watchword in medicine, and it should be continued to its logical conclusion by seeking to prevent sickness. If the victims of indigestion, anaemia, faulty teeth, defective vision, rheumatic pains, shortness of breath, headaches, and so on, were detected at the outset, the time and wages lost through sickness could be materially reduced. Under the National Health Insurance Act payment was made for the treatment of illness, but under a preventive scheme it was possible that sickness which might end in incapacity for work might be arrested. A plan of operations on a large scale naturally suggested the spending of money, but more payments from employer or employed could not be reasonably expected. It was natural, therefore, to turn to surplus funds belonging to the national health insurance scheme. If politicians were anxious to introduce more legislation, he suggested that the National Health Insurance Act should be so modified that a sickness prevention scheme might be established. In many instances large employers of labour had gone in advance of legislation by erecting factories replete with arrangements for the safeguarding of health. Housing schemes had also been established, welfare organizations set on foot, canteens provided, and various forms of outdoor recreation encouraged. The new Factories Bill had aimed at consolidating the Act of 1901 and subsequent enactments, but had very properly been held over for the present. The bill, when the time came for its introduction, would aim at making further advances in preventive work.

Vital Statistics.

The return of the Registrar-General for Scotland for the third quarter of 1926 shows a birth rate of 20.1 per 1,000, a marriage rate of 6.8, and a death rate of 10.7. The number of births was 24,821. The corresponding rate is, with one exception, the lowest third quarterly Scottish birth rate yet recorded. In the counties the highest rate was in West Lothian and the lowest in Argyll. Of the larger burghs, Coatbridge stood highest with 25.7 and Edinburgh lowest with 18.4. The number of illegitimate births during the quarter, 1,749, is considerably below the average. The number of marriages during the quarter was 8,403. The rate for marriages is the lowest third quarterly rate in Scotland since 1917. The deaths registered during the third quarter were 12,865. The corresponding death rate is the lowest quarterly Scottish death rate on record, the nearest approach being 10.7 in the third quarters of 1922 and 1923. Among the counties the highest rate was in Caithness and the lowest in Peebles. Of the larger burghs, Kirkcaldy was highest with a rate of 12.5 and Dunfermline lowest with 7. The infantile mortality rate for Scotland during the quarter was 64 per 1,000 registered births, being the lowest third quarterly rate yet recorded, with the sole exception of the third quarter of 1923. The rates in the larger burghs ranged from 106 in Dundee to 30 in Dunfermline.

Ireland.

Royal Medical Benevolent Fund Society.

The eighty-fourth annual report of the central committee of the Royal Medical Benevolent Fund Society of Ireland states that the number of grants awarded in the year was eighty-five, as compared with eighty-six in the preceding year. That the income of the society from subscriptions has been increased even to a small degree during a year of marked financial stress is a matter for gratitude, and shows that in most of the counties the interest in the Fund is at least maintained. The income of the general fund from all sources was £2,390 11s. 10d., as compared with £2,097 1s. 6d. in the previous year. Receipts from dividends and interest increased by £66 13s. 3d. Subscriptions paid through the branches increased by £23 7s. 6d., while those paid through the central treasurer increased by £9 10s. 6d. The British Medical Association sent the handsome amount of £54 4s., collected during fourteen

schools with constituent houses are in the greatest difficulty. In the case of Uppingham, consisting of thirteen houses scattered in the town, the scheme of isolation is clearly and completely impossible, and the school cannot protect itself from the town. Nor can the town protect itself from the school if such a school becomes infected, and as the action of disbanding the school at Uppingham has been criticized as likely to spread the disease, it is well to point out that in such a case the public is going to be endangered whether the school is kept open or is closed.

But in the case of a school already attacked, what can a school medical officer do to ensure the safety of those in his charge? He can institute a throat and nose drill with the prescribed gargles and sprays. The results of such prophylaxis are hopeful, but no one could fairly say that it gives security. Apart from this, combined with general health measures, he can do nothing. His chief difficulty is that he cannot possibly isolate contacts, nor can he prevent a certain amount of crowding. What, then, is the position if the school is kept together? If the disease is spread by contact it means that with each fresh case a whole group of children is subjected to a fresh risk; if by carriers or dust, it means that the children are subjected to prolonged danger. In any case, had the children gone home, the risk to them would have disappeared once the initial period of danger was over. If it is reasonably certain that the disease is of epidemic type, there is no way of diminishing the risk to the pupils as quickly as by disbanding the school.

There seems a lack of thought in the criticism of this plan. If a carrier comes home and gives the disease to someone else, how is it worse than if he stays at school and infects a school-fellow? In their respective homes contacts *can* be isolated; in the community of a school they cannot. Further, I am afraid the psychology of parents is hardly allowed for. To ask them to regard this disease as in any way at all comparable with the infectious diseases they know is useless. They recognize no resemblance and, however many cases of permanent paralysis from it they see, and however many cases of children being found dead in bed they hear of, they will not be impressed with such resemblance. They do not look upon their school as a quarantine station, nor do they deem themselves fit to be responsible for the public health; they are simply anxious that their children should escape as quickly as possible and with the least risk. Nor is it reasonable to attribute their anxiety to ignorance, for it is those who know about the disease who are the most apprehensive. Let me relate my experience.

In the late Broadstairs epidemic Dr. Hugh Raven asked me down to consult with him about two schools under his care, neither of which had been infected. A letter was written in which we were able to say that in both cases the schools had not been exposed to any danger for a time already longer than the usual incubation period, and that their position was by then practically safe. Before this report could reach the parents the news of the epidemic was in the press. In one school there were three children from the "Harley Street area." On my return to London the next morning the parents of these three children were the very first to be at me, and I had seen them all within an hour. All of them had settled to take their children home that very day, and only what I was able to tell them kept them from doing so. Their action guided many other parents, and I believe no child was removed after that date. But my point is that those who were most anxious were the very ones who knew the disease; and I must own that to those who asked, should I prove wrong and a case occur in the school, ought they then to remove their children, I could only answer "Certainly."—I am, etc.,

London, W., Nov. 20th. REGINALD MILLER.

In response to inquiries for information we have received the following letters:

SIR,—I am glad to say that now, eleven days after the boys returned home from Uppingham, only one case of poliomyelitis has been reported to us. It is rather a coincidence that this boy has a younger brother at home who was removed from Broadstairs. The total number of cases in Oakham urban and rural districts was fourteen; in Uppingham two cases—the Uppingham School cases. There is very little communication between the two sides of the county. The Uppingham School authorities are well aware of the gravity of breaking up during term—this is the only occasion—but the risk to boys of an epidemic was considered sufficient to justify it. Events have proved this, apart from hundreds of letters from grateful parents, many of them medical men. I do not think it is necessary to deal with the letter of Lord Dawson and Dr. Collier in the *Times*. From letters received by me the profession seem to understand the position.

Now that epidemic poliomyelitis has started in England we are likely to have another outbreak next year. I hope the medical officers of schools will meet to discuss the matter, and formulate a scheme, if possible, to deal with a disease of which so little is known.—I am, etc.,

November 23rd. WILLIAM DUNN, M.B., Medical Officer, Uppingham School.

SIR,—The following are the facts with regard to poliomyelitis at Oakham.

We had three cases in September, one a lad of 15, who died within a week of the appearance of symptoms, the second a local policeman of 28, and the third a girl of 9. The last patient contracted the illness at Leicester, and was sent home to Oakham after the acute symptoms had disappeared. The two latter cases were treated at the local cottage hospital, and were later transferred to the Hospital for Paralysis, Maida Vale.

There was a fourth case, a child, in October, and a fifth, also a child, in November. This last was first seen on November 2nd; since then we have had no fresh cases. There have been no cases in the Oakham school.

I have had two cases in two neighbouring villages, and I understand Dr. Skipworth of Market Overton, the adjoining practice, has had five or six cases.

The extraordinary and inaccurate statements in the press with regard to the epidemic have had the effect of alarming the people generally, and the parents of boys at school particularly. If a calm, authoritative statement could be made by the Ministry of Health with regard to this epidemic it would materially help to counteract this.—I am, etc.,

Oakham, Rutlandshire, Nov. 22nd. T. CLAPPERTON.

We are indebted to Dr. J. E. O'Connor, M.O.H. for Leicestershire and Rutland Combined District, for the following information concerning the notifications of poliomyelitis in the district. The first notifications for the Leicestershire districts were made during the week ending August 21st, and numbered 4; the notifications for the ten weeks August 28th to October 30th were as follows: 5, 1, 6, 14, 4, 4, 2, 3, 2, 4—the total for the eleven weeks being 49. The cases occurred in a great many parishes, and in no instance was there more than one case per house; most of the cases were treated at home. The notifications for the county of Rutland numbered 17; they occurred as follows: 2 in the week ending October 9th, 5 in that ending October 23rd, 6 in the following week, 2 in the week ending November 6th, and 2 (in Uppingham School) in that ending November 13th. In the Oakham rural district, in which 12 cases were notified, there were 3 in one house and 2 in another.

Dr. O'Connor adds: It will be observed that no case has been notified in any of my Leicestershire districts during the present month. In Rutland districts, where 4 out of 17 cases proved fatal, the disease has been relatively far more prevalent, as their total population is under 16,000. It is now eleven days since the onset of the last case.

THE CANCER VIRUS.

SIR,—Dr. Gye in his article on the cancer virus in your issue of November 13th apparently refers to my suggested interpretation of his work—wherein he remarks on "the extremes to which men will go to explain away a fact which runs counter to a strongly held opinion." He also says, "such views, I hope, need no reply."

Besredka's, and the most suitable remedies for the early treatment of this disease, are also under examination. Of 2,570 persons in Coimbatore protected with anti-cholera vaccine only one died, and in this case death occurred within six hours after inoculation, so that infection must have occurred previously. In a series of 1,878 persons inoculated in Salem no deaths from cholera occurred. As regards treatment, recovery was recorded in 80 per cent. of 155 persons in all stages of the disease in another district. During the recent epidemics the district health staffs were substantially increased, and in some cases doubled. The chlorination of drinking-water supplies was extensively employed in preference to Haukinization with very satisfactory results.

Medical Dispensaries in Assam.

An account of the work of the dispensaries in Assam during the years 1923, 1924, and 1925 has been prepared by Colonel C. H. Bensley, I.M.S., superintendent of the civil hospitals in Assam. He reports that the number of hospitals and dispensaries at the end of the triennium was 237, and that on the average there are 2.2 to each 100,000 of the population, and 2.8 to every 1,000 square miles. There was a decrease in the number of patients treated, except in six districts, and this is attributed to the closing of some travelling dispensaries, the transference of medical officers to kala-azar survey work, and the reduction of need for treatment in some localities owing to improvements in sanitation and the establishment of an increased number of private practitioners. In his statistical return it is shown that there was an increase in the treatment of malaria and diseases of the skin, eye, and respiratory system, while there was a decrease in cases of roundworm and rheumatic fever. Cholera also diminished, and the hope is expressed that this will be well controlled in future, since there are now two epidemic units at work, and anti-cholera inoculation is gaining in popularity; three more epidemic units are, however, required. During the three years special efforts were directed towards the control of epidemic diseases generally, and of kala-azar in particular. Campaigns and surveys were organized in districts, and new subcentres opened for treatment. There was an increase in the number of in-patients treated in the hospitals, and a decrease of out-patients. Liberal grants were made by the Government for the purchase of drugs and the general maintenance of dispensaries. While many local boards and municipalities are endeavouring to provide greater facilities for medical treatment by opening new dispensaries, inadequate provision is often made for those already in existence, very many being short of funds for the provision of medicine, equipment, and repairs, and hampered by large outstanding debts. Considerable relief has been derived from Government grants, but it is intimated that such assistance cannot be continued indefinitely. The public support of local board and municipal dispensaries is still very inadequate. Modern dispensary buildings and two cottage wards have been erected at Jorhat. A new ward has been added to the Lungleh hospital, and new dispensary buildings at Bijnai, Krishnai, and Saikhowa. Extensive repairs are in progress at various dispensary centres.

The Burma Government Medical School.

In the annual report of the working of the Burma Government Medical School in Rangoon for the year 1925-26 it is announced that it has been decided to admit no more students, and to allow the school to close down gradually. The educational facilities hitherto given by it will be afforded by Rangoon University. The number of students at the beginning of the year was 171, and 44 passed the final examination subsequently. Training for three months in practical midwifery was arranged for 43 students at the Government Maternity Hospital at Madras; this training is no longer available, and arrangements are now being made for the organization of the necessary courses at the Dufferin Maternity Hospital in Rangoon. Lieut.-Colonel J. Fuller-Good, superintendent of the school, gives an account of its satisfactory progress during the year; in all examinations a high percentage of successes was secured.

Correspondence.

REST IN ACUTE POLIOMYELITIS.

Sir,—Your very admirable article of November 20th (p. 947) on rest for acute poliomyelitis is most timely, and should be carefully noted by all practitioners. We are accustomed to look upon the first stage of the disease as extending from the onset until all pain has disappeared. If there is no pain or very transient pain it is wise to consider the first or acute stage as lasting six weeks, but so long as pain, or tenderness of the muscle, lasts we must regard it as an indication of active irritation of the central nervous system.

During this acute stage it is essential that the child be kept at rest. He should not be allowed to roll and twist in bed. The head, spine, and limbs should be held rigidly by a simple apparatus softly padded to ensure comfort. This Fabian policy may be trying to both doctor and patient, but it is certain that the child is in considerable danger from premature massage and electricity. In the presence of acute symptoms it is dangerous to stimulate the peripheral ends of nerves connected with haemorrhagic and inflamed centres. The room should be kept quiet and darkened, and nothing should be allowed likely to cause excitement. Not long ago, in consultation with distinguished physicians abroad, I saw a child in the acute phase of poliomyelitis. The physiotherapist, with all his apparatus, was already in the room in order to test the muscle reactions, while the child lay unprotected on the bed rolling and screaming in terror. Such an episode is a tragedy, and reflects grave discredit on our profession.

The other point upon which I would lay emphasis is that the paralysed groups of muscles, during the whole of the acute stage and until recovery has taken place, should be kept in the position of relaxation—that is, the limb should be kept extended if the quadriceps is paralysed; the foot inverted where the tibial group is affected; the ankle plantar-flexed where the calf muscles are paralysed; and on the same lines where other groups are involved. This is based on a fundamental principle which admits of no exception.

In conclusion, I wish to subscribe to all you say in regard to the closing of schools. With the knowledge we have of the infectious nature of the disease and its spread in the United States, there can be no justification for sending 500 boys all over the country, some of whom may well be carriers of disease.

I would recommend all who have the responsibility of advising school authorities to read the report of infantile paralysis in Vermont compiled by the late Professor Lovett of Harvard.—I am, etc.,

Liverpool, Nov. 23rd. Robert Jones.

EPIDEMIC POLIO-ENCEPHALOMYELITIS IN SCHOOLS.

Sir,—May I, with all respect, express a doubt that there will be general acceptance of the course of action advocated by Lord Dawson and Dr. James Collier—namely, that, in the presence of an epidemic of acute polio-encephalomyelitis, a school, already infected, should isolate itself and carry on. Let me enumerate the measures at the disposal of the school medical officer who is faced with such a problem.

As long as the epidemic remains entirely outside the school, he can attempt to turn the school into a self-contained and isolated community. In the case of a moderately large boarding school standing in its own grounds this can be done with very fair success. Parents, visiting teachers, and all outsiders can be prevented from entering the building, and the children, with the teaching and domestic staffs, can be confined to the grounds. Considerable difficulty may arise with the laundry, and still more will be met with in the matter of the domestic staff, and a much more reliable domestic than has yet been evolved will be needed to carry the plan through successfully over any length of time. This type of school is most favourably placed, but there are others. Mixed day and boarding schools cannot attempt the plan. Big public

be in no danger of espionage from the sanitary service, thus placing them on a level, as regards liberty, with patients suffering from venereal disease. This would protect the public from mixing for years with infectious cases, often in complete ignorance of their condition. Most of these cases would either never become infectious or would lose their infection under treatment.

The treatment of such cases would occupy only a small fraction of the time taken now in keeping alive more or less permanently in our midst a large number of infectious patients. By the method I propose we should be restoring patients to health and preventing infection all along the line, we should be able to spend much less on hospitals for advanced cases, and colonies and tuberculosis villages would be unnecessary.

The eradication of this disease is largely in the hands of the general practitioner, whose confidence requires strengthening; a large proportion of the cases he sends must do well, and if this is to happen it is probable that a great deal more rest will have to be prescribed in sanatoriums that at present.

We must be careful not to add to the disabilities of patients who are willing to be treated; remembering that at the present time it is not the infectious who are penalized, but only those who have been willing to undergo treatment and thus render themselves innocuous.—I am, etc.,

Ayrshire Sanatorium, New Cumnock, Nov. 14th. EDWARD E. PREST.

SIR,—I read with interest your review in the BRITISH MEDICAL JOURNAL (August 28th, 1926, p. 397) of a memoir by Dr. Stocks and Mr. N. Karn, dealing with the results of treatment in the Belfast Municipal Sanatorium.

The validity of Dr. Stocks's conclusions has been questioned on account of several factors by your correspondents, who have, however, confined their criticisms to the material on which the investigation is based. Even if one assumes that the figures on which the authors base their calculations are quite incomplete and grossly inaccurate, that does not explain the inferior progress of the sanatorium-treated cases. Errors in diagnosis and in recording clinical facts would roughly cancel out in the respective groups compared by the authors.

I should like to point out an error in the joint authors' calculations which goes far to explain the astonishing conclusions reached by this inquiry. Dr. Stocks and Mr. Karn have compared the progress "of 170 incipient cases who were treated during some part of the period (not less than fourteen days) at sanatorium and during the rest of the time at dispensaries, and the progress of 499 cases who received only dispensary or domiciliary treatment" (p. 414, lines 14-17). From this one learns that only 25 per cent. of incipient cases had sanatorium treatment at any period of their illness, and it is important to note that the anatomical classification is based on the physical signs *when the patient is first examined*.

"The anatomical grouping was almost invariably entered on the schedule by the tuberculosis officer when the initial complete examination was made: where this was not done it was usually possible to assign the case to its proper group from a careful examination of the lung chart and report of examination of the chest: in only a small proportion of cases was there insufficient information to enable an anatomical classification to be made." (Page 410, lines 15-19.)[1]

The amount of systemic disturbance in these incipient cases is also estimated *when the case is first observed*.

"To test this possibility each case was classified into one of three groups, S_1, S_2, S_3, according to the severity of symptoms when the case was first observed, as defined in Section 3." (Page 434, lines 26-28.)

The authors admit (p. 436) that the proportion of cases with little or no systemic disturbance is smaller in the sanatorium-treated group, and make a correction accordingly, but they have ignored a much greater fallacy. They appear to have forgotten that the average time interval from first visit to dispensary (that is, the date of classification) to admission to sanatorium is 279 days for incipient male cases and 339 days for incipient female cases (p. 413). We are entitled to speculate as to the relative progress of the sanatorium-treated and the non-sanatorium-treated groups during this considerable space of time. Is it not reasonable to assume that those cases which deteriorated materially during the first six to twelve months of dispensary attendance declared their willingness to enter the sanatorium, especially as the period under consideration (May, 1914, to July, 1917) was one of good employment and high wages?

It appears, then, that of 669 cases of incipient pulmonary tuberculosis in Belfast, 170 had sanatorium treatment after a considerable period of observation. These cases are compared with 499 incipient cases who did not have sanatorium treatment after the same period of observation. Broadly speaking, this is to compare the sick with the comparatively healthy, and it is not astonishing that those who felt well enough to carry on outside the sanatorium should show a higher degree of ultimate progress. May I illustrate the point by an example? On January 1st, 1915, two patients present themselves for examination at the tuberculosis dispensary. Both have suspicious symptoms and physical signs: they are classified L_1, S_1, and advised to attend again. The first patient feels better after a rest, resumes work, and soon ceases to attend the dispensary. The second patient, who has active pulmonary tubercle, becomes worse, perhaps has a haemorrhage, an acute pleurisy, or a rapid loss of weight. Then, after six to twelve months' delay, the second patient consents to "try the sanatorium." By this time the physical signs may be advanced, and the symptoms of tuberculous toxaemia may be severe. Nevertheless, according to the classification of Dr. Stocks and Mr. N. Karn, this patient is an incipient case with slight or no systemic disturbance.

The real value of sanatorium treatment, about which I express here no opinion, will never be assessed by such faulty methods of reasoning as are used by the joint authors of this memoir.—I am, etc.,

B. R. CLARKE, M.D.,
Medical Superintendent, Forster Green Hospital.

Fortbreda, Belfast, Nov. 15th.

[1] The references are to the original memoir, *Annals of Eugenics*, Vol. I, Parts 3 and 4, April, 1926.

A STRANGE EPIDEMIC:
DIARRHOEA: LOCAL ASPHYXIA: RASH.

SIR,—The following are the details of a somewhat perplexing epidemic of diarrhoea which, at the moment of writing, is rife at Sunshine House, Chorley Wood, one of the resident homes for blind babies supported by the National Institute for the Blind. If any readers of the BRITISH MEDICAL JOURNAL have met with any similar cases or can throw any light on the obscure etiology of this outbreak we shall feel greatly obliged if they will communicate with us.

The cases have occurred almost simultaneously among the members of the nursing staff, and among the children; only one domestic, the laundry-maid, has been attacked. Although the symptoms among the adults and among the children have many features in common, there is this distinction, that only the children have suffered from the skin condition presently to be described. But in spite of this difference it is difficult to believe otherwise than that all the cases are due to one common cause.

The symptoms are as follows: the attack commences with a feeling of intense tiredness, followed in twenty-four hours by acute pain in the epigastic region with diarrhoea, and in some cases with sickness. In the adult cases complaints were made of frontal headache with a queer feeling of fuzziness in the head. Intense drowsiness was also complained of, and in one or two cases there were attacks of faintness.

The young children do not appear to be in any great discomfort, but they are distinctly apathetic and listless. One baby, a few months old, showed symptoms of cerebral or meningeal irritation. In none of the cases has there been any rise of temperature, the pulse has been invariably slow, and the blood pressure low. Recovery takes place at the end of three or four days

Dr. Gye must remember we are dealing with an exceptional tumour, and the case perhaps demands an exceptional explanation. At any rate it is neither helpful nor logical to dismiss the view with the hope that it need not be answered. I maintain that the view expressed in my letter to the BRITISH MEDICAL JOURNAL of January 30th last is a possible interpretation of the facts, and well within the scope of scientific conception.

I would therefore again ask the question in the hope that it will be answered, "Has Dr. Gye in his experiments merely broken up the malignant cell into cytoplasm and filterable fragments of nucleoplasm, and then reunited them in another host?" For the essential and characteristic property of nucleoplasm is its power of auto-synthesis if placed in a suitable pabulum, thus reconstituting itself as the true genetic cell.—I am, etc.,

FRANK B. SKERRETT, M.B., B.Sc.Lond.

Town Hall, West Ham, Nov. 20th.

SURGERY IN GENERAL PRACTICE.

SIR,—It seems to me a most unfortunate circumstance that Sir James Berry, at the Royal Society of Medicine's dinner, should have considered it a *public* duty to reflect prejudicially upon the present-day tendency of general practitioners to take up surgery in its larger aspects.

Whether this be the truth or not is beside the point, unless he can also indicate the remedy. His only suggestion in this direction is that the public should exercise care in the selection of a surgeon!

The chief result of his outspoken remarks has been a host of articles, sub-leaders, and interviews in the public press, nearly all of which show complete misunderstanding of what was, presumably, Sir James's real intention—which I take to be is the prevention of general practitioners undertaking big operations more or less promiscuously, without the necessary training, knowledge, and skill. I think the vast majority of the profession will endorse this view.

On the other hand, what do the public, as evidenced by the journalistic efforts it has evoked, know of the distinction between specialists, general surgeons, house-surgeons, honorary medical officers of provincial hospitals, and general practitioners?

It is certainly true that the war led to a great increase in the amount of surgery done by general practitioners by reason of the fact that an army of pure surgeons took an active part in France and elsewhere; and it became a necessity for patients, both hospital and private, to put themselves in the hands of their own doctors or other local practitioners recommended by them. For the first time patients realized that much good work and difficult operations might be performed by local men, and at a much reduced fee. This state of things has continued more or less to this day.

Then, when the war was over, numbers of R.A.M.C. men, accustomed to performing many and varied operations while in the army, so soon as they started in practice as partners or otherwise naturally did all they could to continue to get as much surgery as possible. The able man, in either of these categories, if honest, would only undertake such things as he felt competent to do; cases beyond his ken, and special work, he would advise being given to a "special" surgeon.

It is useless to make sweeping remarks about general practitioners—they vary in quality and degree as men may in any other profession, or even as surgeons do themselves, and, as a matter of fact, outside the big cities they are all general practitioners who staff the hundreds of provincial hospitals.

If general practitioners are to be prevented from doing big surgery, then many thousands of urgent abdominal cases and tens of thousands of sub-urgent cases would have to be sent to London and other large centres. And with what result?—no beds to hold them, or not enough surgeons to operate.

No! Common sense must be introduced with the subject. Who is to decide what or which is a major operation—what is to be done if an apparently small beginning results in a great finding? Is the operator to wait until a bigger man arrives—too late, from the patient's point of view?

In my opinion the big men are themselves to blame to a great extent. Fees are too often grossly beyond the actual value of the operation, and the public know that many local men are competent and willing to do the same thing with an equally good result for a very much smaller fee, and they trust their medical adviser to recommend a special man for the job if they think it necessary. It seems so unfair that one fee should be ten guineas and another two hundred—the increase in relative value is fictitious.

I am quite sure the swing of the pendulum towards too frequent operation by general practitioners not on hospital staffs will soon begin its return journey and normal will gradually be attained; but I am equally sure that each man should endeavour to make and keep himself as efficient as possible, and I am also equally sure that any breach in the good relations between general practitioners and consultants—who, if not always complimentary, are complementary to one another—can only militate against the best interests of the public and the profession.

That is why I think all such public utterances as those made by Sir James Berry are so harmful, and one can only hope they will not be repeated. I beg to enclose my card.—I am, etc.,

November 22nd. A GENERAL PRACTITIONER.

SIR,—May I, as a general practitioner, crave space to express my indignation (shared, I feel sure, by my brethren) on reading the views aired by Sir Arbuthnot Lane, and adumbrated by Sir James Berry on November 18th?

I write to you, Sir, because, generally speaking, we general practitioners do not choose to figure largely in the lay press. We feel that the representatives of the public papers have access to our journals, and that it is perhaps a little beneath the dignity of a general practitioner to depreciate publicly the work of his colleagues.

Sir James Berry is quoted as saying, "Those of us who are behind the scenes in the surgical world see only too much of what is going on." May I add that those of us who are behind the scenes in general practice see a good deal too? And some of our most difficult cases are those who, in Sir James Berry's cryptic words, "wanted an operation and took care who did it."

Sir Arbuthnot Lane sums up the situation by saying that people get exactly what they pay for. Herein he does his own great profession and a vast body of conscientious practitioners a grave wrong. He should have added that this was strictly his own experience. There are those amongst us who do not excise our pound of flesh from every patient; it would be a sad and bad day for many of our needy patients if we did. "There is only one remedy" [says Sir Arbuthnot Lane]; "we must educate the coming generations of doctors." Perhaps he may be induced to assist at this great and onerous task himself when he has completed his education of the public.—I am, etc.,

EUGENE H. COYNE, *M.C.*, M.Sc., M.B.

London, S.W.2, Nov. 20th.

SANATORIUM TREATMENT.

SIR,—In answer to Dr. Weatherhead's kind criticisms of my remarks in a recent number of the JOURNAL, I may say that twenty-five years ago I analysed the histories of about 300 patients who had been inmates of the Brompton Hospital, most of whom were at that time well advanced cases of pulmonary tuberculosis, and most of them had been infectious for years. I found that the initial symptom in 19 per cent. was haemoptysis, and that the time between the haemoptysis and admission to hospital averaged three years. In addition, in 20 per cent. of the cases the initial symptom was pleurisy, and the time between the pleurisy and admission to hospital averaged four and a half years.

It would thus appear possible to admit to sanatoriums 40 per cent. of cases, the majority of them curable, without filling the sanatoriums with doubtful material. Ordinary methods of differentiating cases of haemoptysis and pleurisy not due to tuberculosis would be used; where no other cause for the disease could be found, then the cases should be treated as tuberculous without delay. It should be explained to these patients that if they recovered they would

Mr. Robert Harry Lucas died on November 6th at his residence in Bury St. Edmunds, aged 81. He was the third son of Dr. Thomas Lucas of Burwell, Cambridgeshire, and received his medical education at the Middlesex Hospital, where, after obtaining the diplomas L.S.A. and M.R.C.S. in 1869, he held the posts of house-surgeon and resident medical officer for several years. In 1879 he began private practice in Bury St. Edmunds as a partner of the late Dr. McNab, whom he afterwards succeeded. He was a member of the honorary staff of the West Suffolk General Hospital, and took a leading part in the organization and extension of its surgical department. On his retirement from active practice in 1909 Mr. Lucas was appointed consulting surgeon. For many years he held a commission as surgeon captain in the Loyal Suffolk Hussars; during the late war he was attached to the Suffolk Depot Military Hospital, and was a member of the Military Service Medical Board. He was a justice of the peace for Suffolk and a regular attendant at the Thingoe Petty Sessions. Mr. Lucas gave active support to the British Medical Association over a period of many years, and was a member of the East Anglian Branch Council from 1899 to 1903. He was chairman of the West Suffolk Division in 1904, and a member of the Representative Body in 1912 and 1913. He leaves a widow and one son, who is in the medical profession.

Dr. William Frank Morgan, who died suddenly on November 3rd at Wilton, near Salisbury, at the age of 38, received his medical education at the London Hospital, and obtained the diplomas M.R.C.S., L.R.C.P. in 1913. After assisting in a practice near Leeds, he obtained a commission in the R.A.M.C. at the beginning of the war, and spent most of his service in the front line, retiring after the armistice with the rank of major. Since 1920 he had been in partnership with Dr. A. W. K. Straton at Wilton, where he became very popular by reason of the soundness of his work and the quiet kindness of his nature. He was a member of the British Medical Association and a Fellow of the Royal Institute of Public Health.

Universities and Colleges.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Annual Meeting of Fellows and Members.

The annual meeting of Fellows and Members of the Royal College of Surgeons was held on November 18th, with the President (Sir Berkeley Moynihan, Bt.) in the chair. About sixty were present.

The President said that the Supplemental Charter as prayed by the College had been granted. It was approved by the King in Council on July 26th, signed and sealed on August 16th, and received by the College on August 24th. The charter itself made no alteration in the by-laws, but it gave the Council power to do so. These had to undergo a rather tedious process before coming into force, but a process deliberately made slow in order that the fullest consideration might be given to any changes. These changes must be considered at three meetings of the Council, they must then be submitted to the Home Secretary, be examined and allowed by certain Law Officers of the Crown, and finally approved by the King in Council. Alterations in certain sections of the by-laws, required to carry out the provisions of the new charter, had already passed through certain of these stages, and it was hoped that the new by-laws, if they received no challenge from the Law Officers, would come into force early in the New Year. Turning to other matters in the annual report of the Council, Sir Berkeley Moynihan said that the award to Dr. Gye of the Walker Prize would be approved by the whole profession. (Applause.) The Cartwright Prize had been awarded to Dr. Sim Wallace, and the Lister Medal to a great friend of his own, Professor von Eiselsberg of Vienna. The College had been approached by the Canadian Medical Association, which desired facilities for Canadian medical practitioners to obtain, by post-graduate study and examination, the Fellowship of the College. Certain quite informal discussions had also taken place between the Council and representatives of Australia. He need not enter into this matter at the moment; the only thing necessary to say was that every member of the profession would desire the Council to do whatever was in its power to bring about a closer relationship between the Dominions and the College. (Applause.) The last year had been very satisfactory in respect to two matters. The College last year issued 768 new diplomas of membership. This figure was second only to the highest in previous years. Clearly the diploma of membership, despite certain disadvantages which apparently in the minds of some members still attached to it—(laughter)—was a diploma very highly valued. So far as the finance of the College was concerned, the receipts had only on one previous occasion been larger than they were during the last College year.

In reply to Mr. C. E. Wallis, who asked what was the cost of obtaining the Supplemental Charter, the Secretary said that the fees paid to the Government authorities were £102; the total cost, including the official fees, was somewhere about £250. Dr. Fitzgerald remarked that out of the total revenue of the College of £45,630, no less a sum than £24,803 was derived from fees connected with Membership examinations. He thought that the expenditure on examinations (£12,962), representing one-half the expenditure of the Conjoint Examining Board, was unduly high. Dr. C. W. Brook drew attention to the examiners' fees in the third examination (£7,228), which he thought an excessive figure.

Dr. H. Wansey Bayly then moved the usual resolution:

> That this thirty-eighth annual meeting of Fellows and Members again affirms the desirability of admitting Members to direct representation upon the Council of the College, and respectfully requests the Council to take a postal vote of Fellows and Members on the general principle as set out in this resolution.

He urged that the system of government at present existing in the College was archaic and not democratic. The College was governed by a Council composed entirely of, and elected by, Fellows, while nearly 90 per cent. of the College—the Members—had neither voice nor vote in its affairs. Before 1843 the governing body was composed of Members only. The Supplemental Charter granting similar rights to women Fellows, Members, and Licentiates as were now enjoyed by men involved an alteration in the by-laws which had not yet come into effect, and he regretted that the procedure could not have been accelerated to permit women Fellows and Members to exercise their new rights at that meeting. To make the Council representative it should include at least one woman Fellow and one woman Member. Although many Fellows were now engaged in general practice the majority were still consulting or operating surgeons attached to the staffs of hospitals, and it might be argued that general practitioners, whose work was in the homes of the people, were in closer touch with the realities, humanities, and difficulties of the great work of the profession than were consulting or operating surgeons. Members of the College had that wholesome dislike of patronage common to all free citizens, and in pressing for some representation for themselves on the Council they were demanding a right and not asking a favour. He added that the Society of Members had on several occasions undertaken a postal vote on this question, and on each occasion the replies of Members, and of Fellows also, had shown a majority in favour of the inclusion of Members on the Council.

Dr. Redmond Roche seconded the resolution, and took occasion to thank the late President and Council for the courtesy shown to the deputation from the Society of Members when it appeared before them to bring forward the case for the direct representation of Members. The Council did not grant the request of the society, but gave it very careful consideration, not only when the deputation was received, but at two or three subsequent meetings held specially to consider the request. He and two other Members then prepared a counter-petition to His Majesty in Council. This went through various stages, and was passed back to the Council of the College for observations, and the matter got no further, the Council considering that controversial questions were being introduced which would imperil the obtaining of the charter. He demurred to the word "controversial," though it was, of course, difficult to get unanimity in the profession on any question really worth considering. With regard to the postal vote, he felt strongly that the granting of representation was a matter of abstract justice, and it was not usual in proposing any extension of franchise to invite the people concerned to say whether they wished to be enfranchised or not. But if the Council really thought this was an exceptional case in which the opinions of Members and Fellows generally should be sought, the Council itself was the proper body to undertake the canvass, and he and his friends had no fear whatever of what the result of any postal vote would be. He added that although the Council had given an unfavourable reply to the deputation, a happier atmosphere had been created as a result of recent events. A new era in the negotiations between Members and the Council had been inaugurated, and he hoped that the Council of its own volition would see its way to concede this request.

Mr. Ernest Ware created some amusement by paraphrasing a passage in the President's recent oration before the Medical Society of London, in which he had pleaded for greater union between the surgeon and the physician: "How much more rapid our progress would have been, and how much more fertile our labours, what waste of time and effort would have been spared, if instead of each living inside his own impenetrable ring-fence, the Fellow and the Member had met on common ground in the interests of the College." Dr. C. W. Brook, speaking as a parliamentary candidate, said that the time was approaching for a change of Government, and when this question came forward the whole matter of registration and qualification would be involved; among other

The real peculiarity of this epidemic is that among the children, in addition to the symptoms already described, there is a condition of the toes and feet which looks like local asphyxia almost amounting to gangrene, the parts affected appear as if they were frost-bitten, and there are localized spots of erythema which look as if they would ultimately vesicate, but in no instance has this actually taken place. The spots range from the size of a small pea to that of a large bean; they are round or oval in shape. They are distributed over the toes, the soles, and the dorsum of the foot, and none have been noticed in any other situation. They are painless, and not tender to pressure. In the end they become dry and scaly and appear something like erythema iris or ringworm.

The epidemic started on November 13th, and has continued intermittently up to the present time. Out of 24 children 11 have been attacked, and out of 10 nurses 8 have fallen victims. Only one of the domestic staff has been attacked, and she slept in the nurses' quarters and had her meals apart from the rest of the other servants.

The etiology of this epidemic is complicated by the fact that during its course there was an overflow from an unsuspected cesspit which flooded the cellars and filled the whole establishment with a foul-smelling effluvium.

Although in most of its features the epidemic is more like one of infective origin, the absence of all pyrexia militates against this diagnosis. Its intermittent character is contrary to the diagnosis of food poisoning or botulism, and poisoning by sewer gas does not seem altogether probable.—We are, etc.,

H. J. Cardew,
Medical Officer, Sunshine House, Chorley Wood.
Eric Pritchard,
Consulting Physician for the Sunshine Homes for Blind Babies.

November 21st.

CLOTHING AND CATARRHS.

Sir,—Dr. Leonard Williams accuses me of an act of crude discourtesy in writing so strongly as I did "over a legitimate difference of opinion as to the respiratory function of the skin." If this were the case I should indeed feel ashamed to have written my letter, but, as he evades the greater part of my argument, I hope I may be allowed to try and refute his accusation.

I made three points against Dr. Williams's hypothesis. The first and least important was that the respiratory function of the skin is almost negligible. The second was that, even supposing that this function is important and were abolished, leading to increased respiration by the lungs, there is no sort of reason to suppose that this would lower their resistance to bacteria. Increased respiration for most people is surely healthy. My third point was that in so far as warm clothing acts on the respiratory function of the skin it tends to increase it.

To the first point alone Dr. Williams replies to the effect that while such is the usual teaching, he differs, as he might, on such a question as the function of the appendix. To this I rejoin that here is not a doubtful question in medicine, but an established fact in the science of physiology, established by direct experiment, and only to be refuted by such. But, even allowing that Dr. Williams is right by some intuitive process and the physiologists are wrong, and that by a further intuition he is correct in supposing that they have made another mistake in saying that hyperaemia and sweating increase the skin's respiration, and that he elects so to dispose of my third argument, he has still to answer my second, which combats the very essence of his hypothesis.

It was the cumulative effect of these three points which really made me think that it was more charitable to assume that Dr. Williams did not advance his idea seriously, but thought it was good enough to use to rub in some doubtless excellent hygienic precepts in the same way as most of us may be led into making dogmatic statements to patients for their good.

That was my excuse for the tone which I adopted in my first letter. If Dr. Williams does now intend to maintain his hypothesis in a scientific journal, I can only say that I have here given fully my reasons for opposing it, and that while I regret the misapprehension which gave rise to the tone of my first letter, I also regret that Dr. Williams did not emulate the writers therein referred to, but chose the medium of a popular article in the lay press to exploit such a remarkable contribution to the pathology of catarrhs.—I am, etc.,

A. R. Jordan.

Dover, Nov. 21st.

Sir,—In view of the fact that the epidermis consists of four strata (each composed of several layers), that the surface is cornified and covered by a film of grease, and that the whole is non-vascular, respiration through the skin would appear, if not impossible, certainly negligible.

Dr. Leonard Williams asserts it does take place. Will he please inform the profession as to the nature of his experiments in proof of his contention.—I am, etc.,

J. F. P. Gallagher.

Bournemouth, Nov. 22nd.

Obituary.

The late Dr. Francis Warner.

Dr. Francis Warner, of whom an obituary notice was published on November 6th (p. 857), was a pioneer in the investigation of mental abnormality from the physical standpoint. The greater part of his work was connected with the study of children, and led to such important practical sequels as the provision of special schools for blind, deaf, and defective children, and the eventual adoption of a more hopeful and scientific attitude to cerebral disorders. In the course of a paper before the Section of Psychology at the Glasgow Meeting in 1888 he enumerated the physical signs which, in his opinion, pointed to slight degrees of mental impairment, and he suggested that an investigation should be made on a large scale to determine the degree of mental health of children in primary schools. A committee was appointed for this purpose by the Council of the British Medical Association, and became part of a large organization; it carried on its work until 1897, assisted by grants from the Association, amounting in all to £653. The first report of the committee appeared in 1889; considerable difficulty had been encountered in obtaining permission for the examination of children in certain primary schools, and a recommendation was then made that a scientific investigation on a larger scale should be instituted by the Government. In the course of the nine years during which the committee was at work Dr. Warner examined systematically 100,000 children, and statistical reports were issued from time to time. In 1890 an account of the examination of 50,000 children, seen in 106 schools in London, was published in the report of the Commissioner of Education for the United States, and a full report was published later by the British Medical Association, with recommendations as to education and training, several of which were adopted in subsequent legislation. Considerable differences in the development of children were found in certain localities and nationalities. Various other reports were published later in the British Medical Journal and, as already mentioned, in the *Journal of the Royal Statistical Society*. Dr. Warner became, naturally, a recognized authority on this subject, and took an active share in the work of the Royal Commission on Blind, Dumb, and Defective Children in 1889, the Departmental Committee of the Local Government Board on the Feeble-Minded in 1896, and the Committee of the Home Office on Reformatory Schools in the same year. Two years later he was associated with a departmental committee of the Educational Department, which investigated problems concerning defective and epileptic children, and in 1903 was a member of the Royal Commission of Physical Training in Scotland. His main conclusion that brain conditions, including mental action, could be interpreted in terms of neural function, and be considered physiologically and pathologically, was finally established, and considerable light was thrown by him on the problems of infant mortality and feeble health in childhood.

The University of London Bill.

Lord Eustace Percy (President of the Board of Education) moved the second reading of the University of London Bill in the House of Commons on November 19th. It proposed, he said, to appoint commissioners to draw up statutes for the University in general accord with the report of the committee presided over first by Lord Ernle and later by Mr. Hilton Young. The committee reported that the University had no financial resources for the development of teaching and research save the balance of examination fees. The committee thought that present and prospective grant-governing committees should be able to deal with a central university body. The bill proposed to give representation on the Senate to the constituent schools of the University and to establish a Finance Council. The Board of Education had nothing to do with the bill nor would it have anything to do with the control of the University when the bill passed. One object of the bill was to get rid of the control of the finance of the University by the purely departmental and bureaucratic University Grants Committee. Dealing with criticisms of the bill's proposal to eliminate the nominated third on the Senate, Lord Eustace said it was only by chance that this nominated third represented an outside independent element. It contained, for instance, representatives of the Royal College of Physicians and of the Royal College of Surgeons, but at the present moment there was no representation of the medical schools. He gave an assurance that there was no intention to interfere fundamentally with existing schools in the University.

Mr. Trevelyan, for the Labour party, hoped the bill would receive a second reading.

Dr. Graham Little moved the rejection of the bill. He said he had been elected to Parliament in 1924 because he opposed the reconstitution of the University on the lines of the Haldane Report. There were forty-four schools in the University. The Faculty of Medicine had between 3,000 and 4,000 students. The bill was an attempt to wreck the independence of the schools, of the University, and of the students. The theological colleges had said they would not remain in the University if regulations curtailing their freedom were enforced. He was convinced that the medical schools would follow this example. One medical school had for many years refused to take the grant from the Board of Education. Another was threatened, a few years ago, by the Treasury Grants Committee with a cessation of the grant unless it consented to become a special school of medicine, instead of remaining a general school. The school, which had been a school of medicine for more than a hundred years, refused to modify its character. It worked out its own salvation and became able to support itself, and, when it had achieved that consummation the Treasury Grants Committee gave it the grant. It was useless for Lord Eustace Percy to express sympathy for university independence and then to devise machinery which must destroy that object.

Sir Alfred Hopkinson hoped that the questions raised by the bill would be settled as soon as possible. Dr. Little's motion for rejection was not pressed to a division. The bill was read a second time and sent to a standing committee.

Lead Poisoning Bill.

The House of Lords went into Committee on the Lead Paint (Protection Against Poisoning) Bill on November 18th. This bill has passed the House of Commons. Lord Arnold moved to insert a new clause prohibiting, from November 19th, 1927, the use of lead paint in painting the interior of buildings, save for artistic purpose, or in the process of fine lining or in accordance with a special order of the Home Office. Lord Arnold said the bill as it stood was a breach of the Geneva Convention of 1921. Every year some hundreds of men suffered from plumbism, and forty or fifty died from its effects. Experience would not support the Government's contention that regulations would stop or materially alleviate the injury done by lead paint poisoning. Thirteen years of regulation in the pottery industry had not stamped out lead poisoning. The Home Secretary had lately admitted that in one firm in the Potteries three cases of lead poisoning had occurred this year, one fatal. The Home Secretary had remarked that regulations had not been carried out. Lord Arnold contended that enforcement of regulations would be more difficult in house painting, where men did not work in masses. Lord Desborough, for the Government, had said that the position had been changed since 1921 by the introduction of wet-rubbing, and that great things were expected from a waterproof sandpaper. Lord Arnold asked whether the wet-rubbing process did not cause a cream to be formed, which got under the nails of the men who were working and into the system. He remarked that the Government itself was not confident about the bill.

The Bishop of Southwark contended that the only way of dealing with the problem was to prohibit altogether the use of lead paint.

Lord Desborough said the Government considered that action by regulations was possible at once, and would save many lives. No part of the British Empire had ratified the draft Geneva Convention of 1921 on the use of lead paint, and the Scientific Committee of the International Labour Conference had preferred a system of regulation to the prohibition of lead paint for internal work. The Government regulations for the prevention of dust and in regard to scraping and rubbing down paint would apply to external as well as to internal work.

The proposed new clause was defeated by 45 to 23.

The first clause of the bill proposes, among other things, to prohibit "dry rubbing down and scraping." The wet process of rubbing had the strong endorsement of Sir Thomas Oliver.

Lord Desborough said that the Home Office regulations would provide that every surface must be deemed to be painted with lead unless the contrary were proved. The amendment was withdrawn.

On Clause 2, which prohibits the employment after November 19th, 1927, of any woman or young person in painting any part of a building with lead paint, Lord Balfour of Burleigh moved that women be not excluded Only some hundreds of women would be affected, and they ought to be allowed to choose for themselves. The medical theory that women, as women, were more susceptible to lead poisoning than men dated from the days when very poorly paid women in large numbers were engaged on dangerous processes in the Potteries.

Lord Dawson of Penn doubted whether the case for the special protection of women was strong enough to justify their exclusion. He would place more reliance on the women themselves than on any regulations in deciding whether they should undertake painting. Women were precluded from entering many occupations because they were physically weaker than men, but painting was a skilled trade to which they were physically suited, unless they could be proved to be specially prone to the poison of lead. The figures at present available appeared to show that lead attacked women, especially young women, more often and more severely than men. But these figures were mainly taken from old days in the Potteries when women largely undertook the less skilled and more dangerous forms of work. There was ground for the view that a large part of the proclivity of women was the result of economic position rather than of sex. Until a further inquiry was undertaken in the light of modern knowledge he doubted whether there was a case for excluding women from the painting trade. It had been established that the respiratory tract was far and away the most important route whereby lead entered the system. Dirty fingers and unclean mouths had indirect effect by making people unhealthy and lowering their resisting power. If it were true that by substituting wet for dry methods the proposed regulations would eliminate the dust, quite possibly the greater proclivity of women would fall nearly to zero. Lead produced abortion and miscarriages, but he ventured to think that women were quite capable of protecting themselves. Dust, and dust only, mattered, and if the dust was prevented from entering the respiratory tract the women would not abort. The figures showing that lead poisoning, in bringing about abortion, often went through the male as well as the female were most interesting as well as tragic. Where the wives had never worked in lead mines and the men did so, 40 per cent. of a given number of pregnancies ended in miscarriage. There the poison was carried by means of the man, and other figures bore that assumption out. If women were excluded and men left, but the regulations were bad, miscarriages would still occur. If the regulations were good, as he believed them to be, women and men would alike be protected. He called attention to the fact that by Clause 1 of the bill the Home Secretary could order a medical examination, which would often discover the early stages of lead poisoning before the person had any symptoms. He hoped that through the activities of the Industrial Research Council means would be found whereby it could be ascertained by some biochemical test which individuals were prone to lead poisoning. A large number of people could breathe lead with apparent impunity, just as large numbers of people could drink alcohol with comparative impunity. There were others who, after a fortnight's work in lead, were apt to get poisoned.

Lord Haldane suggested that the question whether women were in greater danger of lead poisoning than men should be referred for inquiry to the Medical Committee of the Privy Council or preferably to the Committee on Civil Research.

Lord Desborough said that if the bill were shelved for inquiry it could not pass this session. Under the Women and Young Persons (Employment in Lead Processes) Act, 1920, women were not allowed to be employed in a great many processes involving the use of lead. The balance of medical opinion was overwhelmingly on the side of the views on which the policy of successive Governments for thirty-five years had been based. The opinion of Sir Thomas Oliver was: "On the whole females, particularly young females, suffer more severely from plumbism than males." He went on to say: "My contention is that it is largely owing to the power of lead to inflict harm upon the reproductive organs of women that the female sex is so liable to be adversely influenced by the metal." That contention was at the bottom of the regulations which had been adopted by Parliament. Sir Thomas Oliver had also said: "An interesting point in regard to maternity and plumbism is that, while the expectant mother does not show any sign of plumbism and is apparently not suffering from lead poisoning, she transmits to her babe such a legacy of lead that the infant is born dead or dies shortly after birth." In his book on lead poisoning and lead absorption, which was written in conjunction with Sir Kenneth Goadby, Sir Thomas Legge stated unequivocally that women are more susceptible to poisoning by lead than men. The Special Commission on unhealthy processes appointed by the first International Labour Conference, which met under the Treaty of Peace at Washington in 1919, had passed unanimously a resolution stating that, although absolute proof was lacking that women were considerably more susceptible than men, their role as mothers made it necessary to consider special precautions. One of the results of this Commission was the Employment in Lead Processes Act. The Commission recommended that the subject of women and painting should be referred to a later conference. This was done, and the painting industry was considered by a conference in 1921, and a draft Convention was adopted by it, containing the provision for the exclusion of women which had been included in the Government's present bill. Lord Desborough also quoted from a publication of the International Labour Office which said: "All agree that in women lead poisoning assumes a more severe form (manifesting itself in convulsions and amaurosis, etc.) than in men. . . . It is not necessary for the mother to be affected by lead for the children to develop symptoms of lead poisoning."

things the organization of the College would come under review, and drastic measures might be taken in the House of Commons.

Mr. HOWARD STRATFORD, while of opinion that the majority of members of the Council should be Fellows, thought it would be all to the good if two or three Members were included. The Council and the College would greatly benefit from the co-operation on the Council of a small number of well informed general practitioners. Dr. L. B. WARD said that the limit of constitutional methods of protest had now been reached, and if nothing came of the present resolution the Society of Members would reduce itself to a farce by proposing further annual resolutions. It would be very regrettable to have civil war in the College, or the boycott of a section by the majority, yet this might happen if the Council persisted in its narrow-minded view of the functions of government. Dr. F. W. COLLINGWOOD and Mr. R. GILLBARD also supported the resolution, the latter making a personal appeal to the new President to seize this rare opportunity of breaking down exclusiveness and generating peace.

The resolution was then put to the meeting and carried with one dissentient.

UNIVERSITY OF LONDON.

A MEETING of the Senate was held on November 17th, with the Vice-Chancellor (Sir William Beveridge) in the chair.

Regulations were adopted for the recently established academic Diploma in Anthropology.

The degree of D.Sc. in Physiology was conferred on D. T. Harris, an internal student, of University College, for a thesis entitled "Biological action of light."

Sir Holburt Waring, M.S., F.R.C.S., has been elected chairman of the Brown Animal Sanatory Institution Committee for 1926–27.

Semon Lecture.

The Semon Lecture, 1926, as already announced, will be given this year by Dr. A. Brown Kelly of Glasgow on Thursday, December 2nd, at 5 o'clock, at the house of the Royal Society of Medicine (1, Wimpole Street, W.). The subject of the lecture is "Nervous affections of the oesophagus," and the chair will be taken by Dr. Andrew Wylie, President of the Laryngological Section of the Society. Reception and tea at 4.30 p.m.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—R. Bobo, J. M. Moran, D. D. Stidston, L. D. Williams.
MEDICINE.—P. V. Bamford, R. Bobo, S. B. Browning, K. Roberts, D. Jacobson, E. H. Waller.
FORENSIC MEDICINE.—B. Best, L. O. Jaggassar, H. Rundstrom.
MIDWIFERY.—B. Best, J. de Rosa, B. Elliott, L. J. Lawrie, L. W. Rose, D. D. Stidston, N. W. Wood.

The diploma of the society has been granted to Messrs. S. B. Browning and J. M. Moran.

Medico-Legal.

ALLEGED NEGLIGENCE: JURY DISAGREE.

IN the King's Bench Division of the High Court of Justice, on November 22nd, after a four days' hearing, before Mr. Justice Horridge, a special jury disagreed upon a claim brought by Edwin Battershill, a wholesale manufacturing furrier, against Alan Cowan Mann, M.B., Ch.B.Edin., of Staines, for damages for alleged negligence and lack of skill in failing to diagnose that he was suffering from a fractured clavicle after an accident. The defendant denied negligence, and counter-claimed for £1 10s. fees.

Mr. Ernest Charles, K.C., and Mr. Rowland Thomas (instructed by Messrs. Saunders, Sobell and Co.) appeared for the plaintiff; Mr. A. Neilson, K.C., and Mr. H. C. Dickens (instructed by Messrs. Hempson) appeared for the defendant.

The Plaintiff's Case.

Mr. Charles, in his opening, said that on December 6th, 1925, whilst Mr. Battershill was staying at Staines, he slipped as he was approaching the house of his friends, falling with great violence on his left shoulder. Dr. Mann examined the shoulder, and assured him that nothing was broken, but advised him to put his arm in a sling. The pain being greater the following day, Dr. Mann made a further examination, and assured Mr. Battershill again that nothing was broken. On December 9th Dr. Mann told him he could return to work on December 14th, and Mr. Battershill, though suffering intense pain and the loss of the use of three fingers, did so. On December 15th Mr. Battershill saw Dr. Lester Samuels of High Street, Whitechapel, who immediately told him he was suffering from a severe fracture of the collar-bone. An *x*-ray photograph, taken by Dr. Marsh, radiologist, confirmed this diagnosis, showing that the broken parts of the bone overlapped by 1½ inches. Counsel said any competent doctor, using reasonable diligence, would have had Mr. Battershill's shoulder *x*-rayed at once, and would then have seen the fracture. An operation was performed, which restored to Mr. Battershill the use of his arm, but, whereas it would have been a simple matter if it had been performed at once, it was, in fact, a serious matter owing to the neglect of the injury.

A number of expert witnesses were called by both sides in addition to the parties interested. For the plaintiff Sir George Lenthal Cheatle, surgeon to King's College Hospital, was called, and, in answer to the judge, he thought that, from the *x*-ray photograph, any competent man could have detected the fracture with his hand. If Dr. Mann happened to be right—that is, as to the impossibility of finding the fracture—he thought Dr. Mann should have advised the patient to be *x*-rayed.

The Defendant's Case.

Mr. Neilson, opening for the defence, said that Dr. Mann's appointments, as medical officer of health to the Staines Urban District Council and medical officer to the Staines Hospital and Staines Union, showed that he was regarded as a competent and careful medical practitioner. Counsel submitted that the most likely course of events was that the pieces of bone remained end-to-end until after December 13th, and overlapped only at a later date. If that were so and the bones did not at first overlap, the treatment by Dr. Mann was correct even if there were a fracture.

Dr. Mann, in evidence, said when he first saw Mr. Battershill he suspected a fracture, but on examination he could find no displacement of bone whatsoever. He told him to put his arm in a sling and go to bed, and he considered that was the proper treatment in view of what he had found. He did not think an *x*-ray photograph would have been of any service in view of what he found.

Mr. Charles (cross-examining): You belong to the Medical Defence Union?—Yes.

Do you agree with this—in the annual report: "In conclusion, the President emphasizes the urgent desirability of an *x*-ray examination being made in every case of injury to a bone or joint"?—I have never seen that before.

Further cross-examined, Dr. Mann said that in his view the displacement of the two parts of the collar-bone was due to the breaking of the periosteum, which had kept the ends in place between December 13th and 15th. The periosteum could be torn by a movement of the arm or a bump on the shoulder or the elbow.

Horridge, J.: With that possibility before you, you thought it wise to allow Mr. Battershill to go to London to work?—Yes.

And to go without having taken an *x* ray?—Yes.

Sir Robert Jones, Bt., said that for a fracture of that kind one treatment was to order the patient to keep the arm in a sling. Having seen the *x*-ray photograph, he considered that, personally, he would not have attempted to manipulate the fracture at all, as the bones, if left in the position in which they were, would unite satisfactorily. Answering the judge, he would not have sent the patient out to his business if the fracture were as shown in the *x*-ray photograph.

Mr. Frank Romer, consulting surgeon to the Jockey Club and the National Hunt Club, said that he personally would have sent the plaintiff to his business, though he admitted that if he knew there was a fracture he would strap the arm to prevent further slipping of the bones.

Sir Joseph Skevington, senior surgeon and radiologist at the King Edward VII Hospital, Windsor, and Sir Herbert Waterhouse, consulting surgeon to Charing Cross Hospital, and president of the Medical Defence Union, also gave evidence favourable to the defendant.

Mr. Justice Horridge, in his summing up to the jury, said the case was a very important and serious one. If a general practitioner agreed for reward to attend a patient he had to exercise all reasonable care and skill. He was not bound, however, to have the attainments of a Harley Street specialist, or to know the most recondite discovery in medical science unless it was reasonably well known to the profession.

The jury disagreed, as stated, and were discharged.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Commons took the report stage of the Merchandise Marks Bill on November 22nd and 23rd. The rapid progress of this and other measures gives ground for hope that the Government will succeed in passing into law before the session ends most of the measures which it has asked Parliament to carry. These include the University of London Bill, the Coroners Bill, and the Public Health (Smoke Abatement) Bill, all of which have been under discussion in the last few days. The University of London Bill has still to go to a standing committee, but has strong Government support. The Smoke Abatement Bill awaits report. No quorum was obtained for consideration of the Coroners Bill in Grand Committee on November 24th, and further progress with the bill this session is unlikely. Time was left at the end of the week in the Commons for a debate on the continuance of the Emergency Regulations, but owing to the advance towards a coal settlement the Government hoped to be able to drop most of them.

The House of Lords had a second reading debate on the Electricity Bill. The Lords have given a first reading of a Poor Law Bill, introduced by the Ministry of Health. November 25th was named for the second reading of this bill, which is purely a codifying and consolidating measure, designed to prepare the way for the promised Poor Law reform.

AT the meeting of the Post-Graduate Hostel to be held at the Imperial Hotel, Russell Square, W.C.1, on Tuesday, November 30th, at 9 p.m., Mr. W. Ernest Miles will give an address on fistula. On Wednesday, December 1st, at the same hour, Dr. M. A. Cassidy will speak on precordial pain. Dinner will be served at 8 p.m. (price 5s.), and coffee and biscuits at 10 p.m. (price 6d.). All medical practitioners are welcome.

THE Fellowship of Medicine announces that on December 2nd, at 5 p.m., Dr. John Parkinson will lecture on cardiac emergencies at the Medical Society, 11, Chandos Street, W.1; the lecture is free to medical practitioners. From December 6th to 18th, at the Infants Hospital, Vincent Square, a special course in infants' diseases will be held for medical officers of welfare centres and others interested. Lectures and clinical demonstrations will be given each afternoon and visits will be paid to the model pasteurizing plant at Willesden, the venereal diseases centre, Holborn, and to the Nursery Training School at Hampstead. Courses in obstetrics can be arranged at Queen Charlotte's Hospital and the City of London Maternity Hospital. Clinical assistantships can be obtained through the Fellowship at the Samaritan Hospital. The following special courses will be held in January: medicine, surgery, and the specialties, at the Prince of Wales's General Hospital; cardiology, at the National Hospital for Diseases of the Heart, for which early application is desirable; diseases of children, at the Children's Clinic and the Royal Free Hospital; and psychological medicine, at the Bethlem Royal Hospital. Copies of all syllabuses and of the general course programme may be obtained from the Secretary to the Fellowship, No. 1, Wimpole Street, W.1.

SIR ROBERT ARMSTRONG-JONES, C.B.E., M.D., of Plas Dinas, Carnarvon, and Dr. William Evans Thomas of Coedladwr, Llanuwchllyn and Ystrad Rhondda, have been nominated as sheriffs for Carnarvonshire and Merionethshire respectively.

IN connexion with the scheme for providing spa treatment for panel patients a deputation from the General Federation of Trade Unions visited Bath last week and investigated the local facilities for treatment of rheumatic diseases under the guidance of the chairman of the Baths Committee, Councillor C. H. Hacker, and Mr. John Hatton, director of the baths, who is also honorary secretary of the British Spas Federation, which is responsible for the scheme. The proposals provide for the treatment of insured persons suffering from rheumatic diseases which are likely to yield to spa treatment, using existing facilities at spas in such a way as not to interfere with the regular visitors. It is hoped to link up the scheme with the mineral water hospitals.

DR. ALEXANDER SCOTT was called to the Bar by the Middle Temple on November 17th.

THE Master and Wardens of the Society of Apothecaries have issued invitations to the winter livery dinner at Apothecaries' Hall, Blackfriars, on Tuesday, December 14th.

A CHAIR of biological chemistry has been founded at the medical faculty of Naples, with Professor Quagliariello as its first occupant.

THE first Polish school for nurses has recently been founded in one of the hospitals at Warsaw by American Jews.

DURING the week ending October 16th 5 cases of plague with 3 deaths, 16 cases of cholera with 11 deaths, and 25 cases of small-pox with 10 deaths were reported by the Far East Bureau at Singapore.

AT the eighth annual general meeting of the Industrial Welfare Society, on November 17th, the report was presented for the year ending June 30th, 1926. The steady increase in the extent and value of the work was the subject of a congratulatory message from H.R.H. the Duke of York, who during the year had visited fifteen firms associated with the society. The report contains an account of the progress made, with special reference to the organization of welfare schemes, the appointment of supervisors, the work of the information department, and various conferences, lectures, and other propaganda activities.

THE Alvarenga prize of the College of Physicians of Philadelphia has been awarded this year to Drs. P. S. Pelouze and Frederick S. Schofield for an essay entitled "The Gamophage." It is announced that essays for the 1927 prize must reach the Secretary of the College of Physicians, 19, South 22nd Street, Philadelphia, on or before May 1st. The value of the prize is about 300 dollars.

THE following five members of the medical profession have been appointed justices of the peace for Glasgow: Dr. John Glaister, jun., Dr. R. T. Halliday, Dr. William Lawson, Dr. Henry L. G. Leask, and Professor Archibald Young, M.D.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

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All communications with reference to ADVERTISEMENTS, as well as orders for copies of the JOURNAL, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the BRITISH MEDICAL JOURNAL are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediocra Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

TINNITUS IN MÉNIÈRE'S DISEASE.

"H. S." (Leeds) asks for suggestions for the relief of the constant "singing noises" in a case of Ménière's disease. Bromides, potassium iodide, hydrobromic acid, gelsenium, and adrenaline have been tried.

CHILBLAINS.

DR. M. STEWART-SMITH (Northwood) writes: I have had considerable success with the high-frequency vacuum electrodes, applied after iodex has been smeared on to the affected parts. Radiant heat is then used after the high-frequency treatment.

RECURRENT ULCERATION OF THE MOUTH.

"A. Y." seeks advice on the following case: A man, aged 25, has frequently recurring small ulcerations of tongue and mucous membrane of mouth generally. The tongue is often painful in parts without any obvious cause. About seven years ago a pipe snapped in his teeth and caught the tongue, and this was, perhaps, the origin of the trouble. Treatment, so far tried without success, as follows: (1) Diet: all condiments and spices forbidden; (2) no smoking; (3) antiseptic mouth-wash (potassium permanganate 1 in 10,000, and also sometimes dibromin 1 in 5,000 instead); the tender spots are treated with glycer. alum; (4) a strongly alkaline mixture was ordered for three or four weeks to check acidity. The teeth are quite healthy. These ulcerations have been occurring for some years, and the above treatment seems to have failed to check them. The general condition of the patient is satisfactory.

NERVOUS RETCHING.

"H. T." writes to ask for suggestions for overcoming the retching excited by the introduction of a denture. The patient is a very nervous man, who retches immediately any foreign body (except food) comes into contact with his teeth, so that he even finds it difficult to smoke a pipe. It has now become necessary for him to wear a denture, but he is unable to do so on account of his hypersensitiveness.

INCOME TAX.

Vacant Consulting-Room.

"E. P." has been living on the outskirts of London and using a consulting-room in the medical quarter. For reasons of health he has moved into the London area and now practises in his own residence. He has given up the use of his consulting-room, but, owing to temporary inability to sublet or otherwise dispose of it, has since incurred the expense of paying nine months' rent without any return. Can he deduct this expense?

*** In the case of the Granite Supply Association *v.* Kitton (43 Sc. L. R., 65) the court refused to allow the cost of removal to more commodious premises; we fear that the taxpayer's claim would be at least no more likely to succeed where the cause of the expense was a purely personal one, such as for reasons of health. The expense incurred by "E. P." after he had ceased to use the consulting-room seems to have been in substance an expense of removal, and therefore inadmissible in view of the above decision.

Partnership Dissolved—Cash Basis.

"A" and "B" dissolved partnership as from June 30th, 1925, and advice is sought as to whether the firm's book debts collected since the dissolution must be accounted for for tax purposes, and, if so, as to the proper apportionment of the assessments for

Lord Phillimore hoped that after Lord Dawson's temperate and, to him, convincing speech the House would not pass prohibitive legislation on a disputed medical question.

The amendment not to exclude women was defeated by 35 to 17. The House then agreed to the remaining clauses and reported the bill without amendment.

Acute Poliomyelitis.

On November 22nd Viscount Sandon asked the Minister of Health if, to obviate the danger of infantile paralysis being spread by reason of boys being withdrawn from infected schools by parents, he would take steps to prevent any school so infected from being closed down or the boys leaving. Mr. Chamberlain (Minister of Health) replied that he was not empowered to take the course suggested, but was always ready to arrange for the medical officers of his department to confer with the school authorities on the precautions appropriate to any outbreak of infectious disease.

The Minister of Health, on November 23rd, said that the following table (here slightly abridged) gave the particulars, so far as they were available, of the numbers of cases notified and deaths recorded from acute poliomyelitis and polio-encephalitis in England and Wales and certain European countries in six-monthly periods in 1925-26.

Country.	First Six Months of 1925.			Second Six Months of 1925.			First Six Months of 1926.		
	Cases Notified.	Deaths.	Cases per Million Population.	Cases Notified.	Deaths.	Cases per Million Population.	Cases Notified.	Deaths.	Cases per Million Population.
England and Wales ...	132	79	3	290	77	7	136	57	3
Denmark	31	?	9	84	?	25	12	?	4
Finland	14	?	4	14	?	4	8	?	2
France	80	?	2	142	?	4	70	?	2
Germany	131	?	2	255	?	4	115	?	2
Holland	12	4	2	20	5	3	8	?	1
Italy	217	?	5	383	?	10	97	?	2
Norway (towns only) ...	17	0	21	70	8	88	5	1	6
Sweden	105	?	17	400	?	66	86	?	14
Switzerland	24	?	6	69	?	18	9	?	2

The number of cases notified in England and Wales during the nineteen weeks ended November 13th, 1926, was 891 (23 per million population). The number of deaths in this period in England and Wales and corresponding figures for cases and deaths in other European countries are not at present available. The number of deaths per million mid-year population in England and Wales for the three six-monthly periods equalled 2, 2, and 1.

Smoke Abatement Bill in Grand Committee.

A Grand Committee of the House of Commons, which included Dr. Fremantle and Sir Richard Luce, began consideration on November 18th of the Public Health (Smoke Abatement) Bill. The first clause provides that a chimney (not of a private dwelling house) sending forth smoke in such quantity as to be a nuisance may be dealt with summarily, notwithstanding that the smoke was not black. To an amendment to insert the word "black" before "smoke," Mr. Neville Chamberlain objected. He said Lord Newton's Committee examined nearly 150 witnesses, who were almost unanimous that the limitation of the present law to black smoke should be removed. He had watched the chimneys of certain works pouring out white smoke which contained the fumes of arsenic and lead, and as the law stood no local authority could take proceedings. Moreover, it was impossible for a central body to define black smoke or the quantity which could be emitted without a nuisance. Mr. Greenwood agreed that "smoke" should include all noxious emanations from chimneys which meant positive injury to health and vegetation. Commander Astbury said that most councils allowed the manufacturer two minutes of black smoke while firing to get up a pressure of steam, and thought this practice should continue. Dr. Fremantle said the bill contained safeguard after safeguard for industry. Those who were keen on getting some measure of smoke prevention from the public health point of view feared that nothing would be done. The amendment was negatived, as was also one enjoining the Ministry of Health to fix standards for smoke.

On the proposal of the bill to make smoke include soot, ash, grit, and gritty particles, Sir Kingsley Wood said it was just as detrimental for these to be emitted as black smoke. Mr. Williams said that forced draught would reduce black smoke, but would produce a greater emission of grit. So would the use of powdered coal as fuel blown on the furnaces. Major Birchall repudiated such protests on behalf of manufacturers. Sir Kingsley Wood said the Ministry of Health did not apprehend that any nuisance would follow the use of powdered fuel if proper steps were taken. Fourteen towns, including Birmingham, Bolton, and Bradford, had power under local Acts to deal with the emission of grit and gritty particles. Mr. Jephcott said that in the new station of the Birmingham Electricity Committee they were spending £30,000 in an effort to eliminate grit, but so far had failed. The amendment to omit grit and gritty particles was defeated.

Asked to explain what processes would be exempted under the bill, Sir Kingsley Wood said that, broadly speaking, they were the Sheffield steel processes. Mr. Chamberlain said it might be true that Pittsburg had been able to make steel without smoke, but Sheffield had not the processes needed, and in its present difficulties could not be forced to adopt them. Mr. Albery asked that exemption should also be granted to cement works, which threw fine dust up the chimney that did no appreciable harm. Evidence in medical reports from Germany and this country was that the health of the cement worker was not affected in any exceptional way. Mr. Chamberlain said he was advised that the emission of white smoke and dust particles from cement works had not in fact been found to be a nuisance.

The International Opium Convention.—Sir Austen Chamberlain, in an answer to Mr. Campbell, said that a ratification of the International Opium Convention had been deposited which covered all parts of the British Empire except Canada and the Irish Free State. Of foreign signatories, only Portugal and the Sudan, so far as the Government knew, had deposited ratifications. The Hague Convention of 1912 continued in force between the States which were parties to it.

Encephalitis and Vaccination.—On November 22nd Mr. Chamberlain told Mr. Groves that he had drawn the attention of the Committee on Vaccination, now sitting, to cases of death from encephalo-myelitis after vaccination. One of the terms of reference of this committee was to inquire into and report on the practical methods which were available in the light of modern knowledge to diminish or remove any risks which might result from vaccination. On November 22nd Mr. Trevelyan Thomson asked whether encephalo-myelitis was mentioned as a cause of death on the certificates of death in the case of the seven deaths from that disease which occurred shortly after vaccination; whether an inquest was held on any of the cases in question; and whether the lymph used for the vaccinations was issued by his department. Mr. Chamberlain replied that he was informed that, so far as it had been possible to identify these fatalities, in none of the seven deaths was "encephalo-myelitis" mentioned on the practitioner's certificate as a cause of death. An inquest was held in one case. In four of the seven cases the lymph used for the vaccination was issued by his department, and in one instance a proprietary lymph was used, but no information as to the source of the lymph used in the remaining two cases was available. The deaths to which he assumed reference was made occurred in 1912, 1922, and 1923.

Notes in Brief.

The Minister of Health cannot undertake to introduce legislation to waive, in cases where proper medical evidence is given on the date when sickness commenced, the rule that sickness must be notified within three days of its occurrence. The official view is that prompt notification of illness is essential to the proper administration of sickness benefit.

Mr. Chamberlain told Admiral Beamish that he would consider whether the terms of the Departmental Committee now investigating the chemical treatment of flour should be extended with a view to its making an authoritative statement on the dietetic value of white bread. The committee could not take up this subject till it had disposed of the matters already referred to it.

Lord Eustace Percy has stated that some preliminary tests and observations have been made among school children on the use of glass which allows the ultra-violet rays of the sun to reach them. Any general recommendation on the subject would, however, be premature.

Mr. Chamberlain has received a report from the local authority which seems to show that the mortuary at Dover is reasonably adequate. Asked whether the coroner had stated that he had received complaints from every doctor in Dover that the mortuary was insufficient, Mr. Chamberlain declined to give any further answer.

Medical News.

THE annual dinner of past and present students of the Bristol Medical School will be held on Thursday, December 2nd, at the Victoria Rooms, Clifton, Bristol, at 7 for 7.30 p.m. The chair will be taken by Professor E. Fawcett, F.R.S. The guest of the evening will be Professor J. T. Wilson, F.R.S. (Cambridge University). Local practitioners, as well as old Bristol students, are cordially invited to attend. Application for tickets should be made without delay to Mr. W. A. Jackman, 15, Mortimer Road, Clifton, Bristol.

THE centenary of the death of Pinel, to whose efforts was largely due the introduction into France of milder methods for the treatment of the insane, was celebrated by the Académie de Médecine in Paris on October 26th, when the General Secretary, Professor Achard, delivered a memorial address.

AT the meeting of the Röntgen Society to be held at the British Institute of Radiology, 32, Welbeck Street, W.1, on Tuesday, December 7th, at 8.15 p.m., Mr. W. V. Mayneord will read a paper on an *x*-ray study of the crystal structure of some biological objects. Mr. Cuthbert Andrews will give a demonstration on the seriascope, a new instrument for serial radiography.

A MEETING of medical practitioners to discuss the question of treatment for tuberculosis has been arranged by the Mayor of Lambeth, Dr. R. S. Pearson; it will take place at his house, 193, Clapham Road, S.W. (near The Swan, Stockwell), on Thursday, December 16th, at 4 p.m.

1925-26 and 1926-27 between "A" and "B." The practice has been assessed on the "cash basis" for many years.

*** It is essential to bear in mind the fact that the income tax Acts attach liability to the earnings or profits of a practice whether received in cash or still owing. The reason for the acceptance of the amount of the cash received as the basis for assessment is that that figure is readily ascertainable and is in the long run the same as the value of the bookings; but it is not the receipts as such which are being taxed, but the profits of the year of assessment. In the present case the profits of the year 1925-26 have been estimated on the average of the three years 1922-1924, taking the gross earnings as the amount of the cash receipts for those years, but the method of arriving at the assessment does not affect the primary fact—namely, that it relates to and is in respect of the profits of the year ending April 5th, 1926. Consequently Dr. "A" should bear the tax relating to quarter of half of the gross assessment for 1925-26, and no portion of the 1926-27 assessment is applicable to him. Whether or not the cash received after June 30th, 1925, should be brought into the calculation of the 1926-27 assessment depends on whether Dr. "B" wishes to continue to be assessed on the cash basis. He is entitled to reject it for the future and to calculate the gross receipts according to the value of the fees receivable for the work done, but of course the cash basis is very much more convenient in practical working.

Car Allowance.

"I. G." bought a new car in April, 1925, for £195, and sold it in July, 1926, for £70, buying a new car of similar make and power for £190. He has claimed an allowance of £120, but the inspector regards £40 of this as a capital loss, that amount "being the difference between the price of a second-hand car fifteen months old and the price" actually received.

*** We fail to see the argument unless the second car was of a more expensive type than the car displaced. If, for instance, the old car was an open tourer and the new one of the enclosed type, then there is some substance in the contention that inasmuch as an improvement had been effected some of the cost must be placed to capital. In the absence of some special feature of that kind we disagree with the inspector's view, and consider that it is irrelevant to bring hypothetical figures into the computation; if "I. G." replaced one car by a similar one, he is entitled to the allowance without such a deduction as is suggested.

LETTERS, NOTES, ETC.

Good and Bad Diets.

"Inquirer" writes: I think everyone reads Colonel McCarrison's writings with much interest and profit, and that published on October 23rd (p. 730) tempts me to ask if he or any other recognized authority would detail a good daily diet for the Britisher, with particular reference to the eating of raw vegetables. We read of individuals and sects who maintain that vegetables should be eaten raw, but I have yet to see anyone do so. As youngsters we stole and ate raw carrots and turnips, but that natural instinct has gone with most adults, evidently to our misfortune, to judge from McCarrison's experiments. Are we to give up cooking our vegetables and fruits, either by boiling or steaming, and give ourselves stoically to taking our vegetables raw? I am sure many would be willing to try if one with McCarrison's authority outlines a diet, detailing the vegetables and fruits to be eaten raw.

Cytolytic Treatment of Cancer.

Dr. Michael C. Grabham, in a pamphlet entitled *The Mastery of Cancer* (published by Messrs. H. K. Lewis and Co., Ltd.), states that some success has been obtained in the treatment of advanced cancer by the local action of trachoma exudate. In this connexion he refers to the publication of A. Fleming (*Proceedings of the Royal Society, 1922*), in which the lacrymal secretion was shown to be endowed with bactericidal powers, to possess a potent lysozyme, and a diplococcus provisionally named *Micrococcus lysodeikticus*. Dr. Grabham reports that Dr. Fortunato Pitta, a medical practitioner in Funchal, found that a few drops of trachoma exudate, when injected into a growing carcinoma, caused immediate inhibition of the vitality of the malignant tissues, and, ultimately, their disintegration, with little or no disturbance. Two cases are mentioned particularly; the first was one of cancer of the uterine cervix in a woman aged 60, and the other of carcinoma of the breast in a woman aged 40. In both complete recovery is stated to have followed the application of the purulent trachoma exudate. Dr. Grabham is inclined to believe that the micrococcus or the lachrymal lysozyme is the active agent, and invites further research with a view to establishing the reliability of this method of treatment. He states that seventeen patients have been treated already in Madeira.

Common Salt and Cancer.

Mr. Fredk. T. Marwood, J.P. (Pleasington, Lancs), writes: In the Journal of October 30th (p. 803) there is an extract from the annual report of Dr. L. J. Picton, medical officer of health for Winsford. In it there appears the following passage: "The staple industry of Winsford is the manufacture of salt from brine. As the mortality rate from cancer at Winsford is no higher than elsewhere, the theory that salt has anything to do with cancer has, says Dr. Picton, no support." As a layman deeply interested in the subject of salt in relation to cancer (on observational and statistical lines only) may I be permitted to explain that in my investigations I am mainly concerned with consumers of salt, salted foods, and salt compounds, although I have not overlooked the point brought forward by Dr. Picton. There are workers amongst many deleterious compounds who pursue their avocations without injury to health. If the M.O.H. for Burton-on-Trent made the statement that because drunkenness was no higher at Burton-on-Trent than in many other places the theory that beer induced inebriation received no support, this it seems to me would be on a par with Dr. Picton's conclusions regarding Winsford and cancer.

Supply of Dogs for Research.

On November 20th a man named Hewett was convicted by Mr. Fry, magistrate at Bow Street police court, for feloniously receiving two Irish terrier puppies, valued at £7, and for cruelly ill-treating them. He was sentenced to six months' imprisonment, with hard labour, on the first charge, and to a further month's imprisonment on the second. It appeared that Hewett had been sentenced at Leicester in 1914 to four months' imprisonment for dog stealing, but had since been working honestly. An inspector of the Royal Society for the Prevention of Cruelty to Animals said that Hewett was stopped when about to take the puppies into the School of Physiology at University College; they were in a sack, and when removed were in a state of complete exhaustion. In a published statement Dr. C. Lovatt Evans, Jodrell Professor of Physiology at University College, said that he had purchased dogs from Hewett since October 11th last. Hewett was a dealer in dogs and other animals, and provided food for the animals in the laboratory; he had signed a declaration to the effect that all the animals supplied to the laboratory were legally obtained. It is unfortunate that the laboratory should inadvertently have had dealings with a dog stealer, but it may be well to point out that the position with regard to the supply of dogs to physiological laboratories is anomalous. The police, we are informed, are by law required to take all stray dogs to the Dogs' Home, where unclaimed dogs, and those for which no ordinary purchaser can be found, are put to death. On the other hand, Parliament and the Government require various researches to be carried out which call for the employment of dogs; it does this through grants to the Royal Society and to the Medical Research Council, has a special committee for imperial research, and is deeply interested in the prevention and cure of tropical diseases. Government employs inspectors to see that all animals in laboratories are properly housed and kindly treated, and requires a return of all experiments in these laboratories to be made every year to Parliament. On the Continent and in many towns of America a university can obtain or buy animals from the dog pound kept by the police; but here a stray dog must be killed in a lethal chamber, but not by an overdose of chloroform after serving a useful purpose. In view of public comments that have followed the prosecution at Bow Street, Lord Chelmsford, Chairman of the College Committee of University College, London, has appointed a subcommittee to inquire into the supply of dogs to the School of Physiology, and the first meeting was held on Tuesday.

Majorca.

We are indebted to Dr. A. Phillips (Cotebrook, Tarporley) for information about Majorca additional to that published last week (p. 963). Dr. Phillips recommends the inquirer to obtain Chamberlain's *Guide to Majorca. 1925*, which is the "official publication of the Fomento del Turismo of Palma, Majorca." This book, written in English, is full of most useful information relating, not only to Palma, but to the whole island. It also contains two good maps and is fully illustrated.

A Photograph in an Advertisement: an Apology.

We have received from the Secretary of the Ardath Tobacco Company a letter with reference to an advertisement of cigarettes in which a photograph of Sir W. Arbuthnot Lane smoking a cigarette was included. The Secretary writes:

This photograph was selected, with others, from a large number submitted, and was purchased by us from a firm of photographers who purported to sell us the copyright. We were in total ignorance as to who was the original of the photograph, and it was not until after some of the advertisements appeared that we knew that we had inadvertently used a photograph of Sir W. Arbuthnot Lane. We need scarcely say that Sir W. Arbuthnot Lane knew nothing of this until he saw his photograph in the press as part of our advertisement. Directly our attention was drawn to this we withdrew our advertisement, and we desire to apologize to Sir W. Arbuthnot Lane and to express our regret that such a mistake should have been made, and as a mark of that regret we have had much pleasure in sending a cheque for 100 guineas to the New Health Society, in which Sir Arbuthnot Lane is so much interested.

Vacancies.

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 35, 36, 37, 40, and 41 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 38 and 39.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 231.